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WONDER Stories

January

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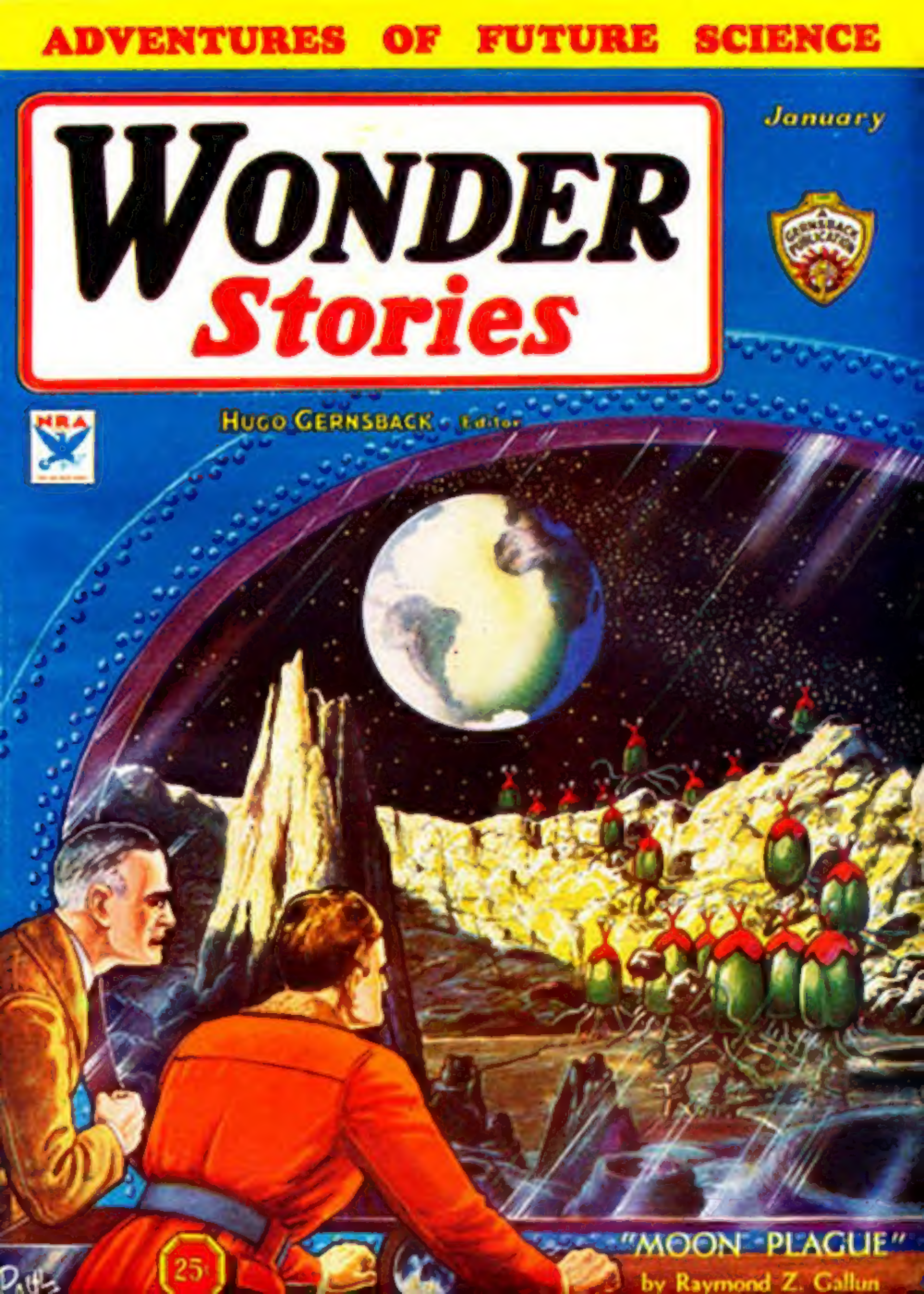

"MOON PLAGUE"

by Raymond Z. Gallun

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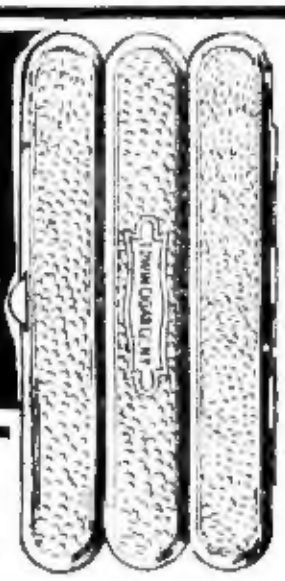

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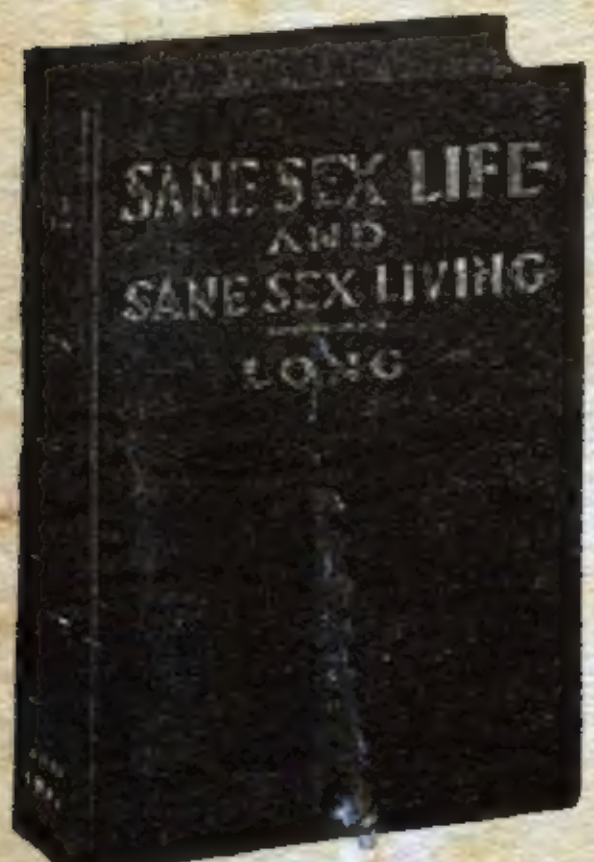

Recently, Judge August Dreyer ruled that a book which tells the truth about sex, by a physician, is not obscene. In rendering his decision, Judge Dreyer called attention to the fact that "Sane Sex Life" is highly endorsed by a former Commissioner of Health of New York City, by a Director of Public Welfare, ministers of every faith, prominent doctors, and by well-known educators.

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R. S. T. (Professor)
New York

Partial Contents

Problems of Sex Life
Necessity for the Information
Correct Mental Attitude
Sex Organs and Their Functions
Advice to Newlyweds
Marital Union
Art and Practice of Love Stimulation
The Perfect Sex Act

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ON THE COVER this month we see the mysterious plant-men of the moon approaching the dwelling of the earthmen, led by the madman, Garth Jubiston. (From "Moon Plague" by Raymond Z. Gallun.) Cover by Paul.

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While you are reading this, music, speech, talk, which originated perhaps 12,000 miles away from where you are, is vibrating in your body, only you don't know it.

But the short wave fraternity all over the world knows this, and for a few paltry dollars they rig up in their own homes a short wave set which brings in stations from the Antipodes. Such sets cost as low as $6.20, believe it or not. So if you are looking for real wonder stories, they are in the making right along.

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PAUL KORNEKE, JR. N. S.
Pittsburgh, Pa.

FOREIGN STATIONS GALORE

It may interest you to know that yesterday, on my Doerle short wave set at 12:45. P.S.T., I heard CFH at Rio de Janeiro. They came in at 10330 Kcs. and the announcing voice was as clear and strong as on an ordinary telephone.

I am using just 45 volts for both detector and audio stage on the plate. What it would do on 90 volts on the audio I do not venture to say.

At the moment 10.35 P.S.T., I am listening to phone from Japan to Hawaii. No station identification however. Around 16,030 K.C.S. KKD—Kauhuku Hawaii just identified his station.

HARRY V. DAVIS.
Penticton, B.C., Canada.

THE WHOLE WORLD

In the past two days I brought in with my Oscillodyne S-W Set the following foreign stations: 12RO, DJC (this with such volume that I was able to plug in the loudspeaker) and a French station which I was unable to identify, but I believe it to be FYA Pontoise, and also another German station which I have not been able to identify as yet.

On Wednesday RAQ was weak and noisy and DJC was loud and clear, but on Thursday the conditions were reversed. I have received many United States stations, such as W9XAA, W9KF, W8XK, W2XE, etc., etc.

In Short Wave Craft, this set was called A WONDER SET, and I certainly agree.

C. W. KNIERIM.
Hollis, L. I., New York.

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These new books, as usual, are printed on a good grade of paper, and contain brand new stories never published before in any magazine.

Each book (size 6 x 8 inches) contains one or two stories by a well-known science fiction author.

The Titles Are:

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Renard is the H. G. Wells of France. With sly humor and yet grim reality he describes the most unusual and startling flight made by man. An entirely new type of transportation dawns upon the world in this masterly story!

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by Manly Wade Wellman

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and

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VOLUME 5
No. 6

WONDER Stories

JANUARY
1934

. . Prophetic Fiction is the Mother of Scientific Fact . . . .

HUGO GERNSBACK, *Editor-in-Chief*
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WONDERS OF MICRO-LIFE

By HUGO GERNSBACK

THE peculiar thing about life is that animal life, as such, seemingly cannot exist by itself but requires other lives for its very existence. By this is meant that, no matter what the organism seems to be, it requires other organisms to sustain it. From the smallest to the largest, each organism is made up of other organisms and, no matter where we go in nature, this rule seems to hold true; from the smallest insect up, each entity is made up of other entities. The smallest *amoeba* has internal organisms to sustain it; and all these organisms are vital to its existence.

As an interesting example, take the termites, the small ant-like destroyers. They have learned how to subsist entirely upon wood cellulose, something that no other animal can do. But the termite itself is not the one who fares well on cellulose. It has, in fact, in its own intestines another organism which digests the wood pulp, a thing that the termite itself could not do. What organisms are inside the little parasites, and what others inside that smaller parasite there are, no one knows; but the chances are that there are parasites upon parasites, and the old adage,

"Big fleas have smaller fleas upon their backs to bite them,
And they in turn have lesser fleas, and so ad infinitum,"

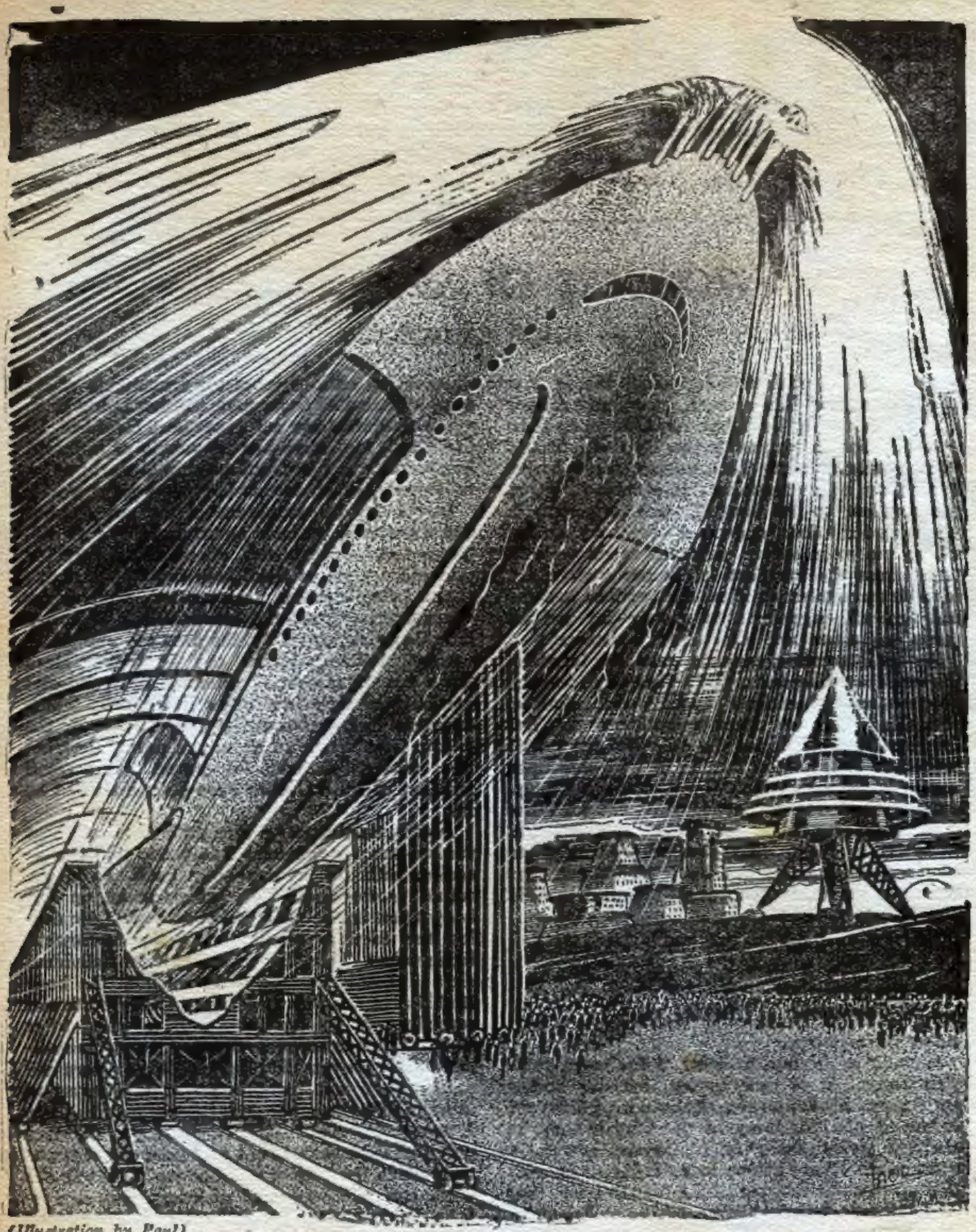
seems to hold true.

Coming to the human being, a far more complex animal, it is well known that our bodies are composed of, literally, thousands of different forms of life. Thinking of the human body as a single living entity is, of course, extremely unscientific. There are so many different entities that go into the making of the human body, that it would take a veritable cyclopedia to list all of them; even though all of them were known, which is not the case. It may be centuries before the last and smallest form of human internal parasite has been found and listed.

In the blood stream, for instance, we find many living entities from the scavenging white corpuscles, called *leucocytes*, to other living cells, many of which have not as yet been classified. In the lungs, too, there are thousands of different live bodies, ranging from the animal world down to bacteria, which are classed in the plant world.

In the mucous membrane of the nose, throat and elsewhere, we have again thousands of different animal-like bodies, all of which fight for existence: some of them help the human body; others bring diseases, such as, for instance, the common cold virus, and others. But it is in our intestines that, probably, the greatest amount of variety of living bodies can be found. Here there are thousands of different bacteria—and not only bacteria, but other living cells which maintain their existence at the expense of the human host. Some of them are purely destructive; others, beneficial. Of course, only a small fraction of the varieties have been classified so far.

And it should not be thought that all of these various micro-organisms live a life of co-ordination with the human body itself. Even the actual *protoplasmic* cells which make up our body (that is, the cells which grow and die during the lifetime of the body) are somewhat independent. Thus, for instance, if an individual dies, it is only his *ego* that vanishes; the body itself is not dead by any means. Cell growth and reproduction go on for quite a while after death. The human body does not decay immediately. Life goes on. For instance, hair grows and nails grow; and the process of disintegration in some cases does not start in until months after a person has died. This, of course, is the case only when the body is in a fair state of preservation, when the moisture is not too great; in the latter case a more rapid disintegration sets in. In a favorable temperature, it has been found that some growth goes on as long as a year after a person has died; and, of course, some of the micro-organisms may carry on for a considerably longer period than this. How long, we do not know.



(Illustration by Paul)

Rockets flamed and roared from the soaring nose of the great cylinder, and simultaneously, the space-ship rocked upward in a tormented frenzy of flight.

THE EXILE OF THE SKIES

By RICHARD VAUGHAN

PART ONE

● The man in the complex and wonderful laboratory—the utmost in equipment that the science of the twenty-third century A. D. could produce—was alone at his midnight vigil. Around him, the bare Andean peaks stabbed harshly towards the starlit sky. Couched among their arid folds, the immense building that housed more scientific miracles than the world has ever yet known seemed almost part and parcel of their rugged wastes. Seen from a little distance, it looked no more than another buttress of the ancient hills. A plane might fly over it and never suspect that here, guarded by invisible and terrible weapons, lay the hidden fastness from which one man was playing for the sole mastery of the world.

The night was starry-still. Looking up, Knute Savary could see the countless, blazing patterns of distant worlds and suns, gleaming like diamond spear-points through the crystal dome of the laboratory. On the televisone, rising like a vast, silver screen, to one side, images formed as he chose under the casual pressure of his hand against one or another button in the vast array on the giant panel below.

At a touch—a whim of this man's will—an invisible beam, unknown as yet elsewhere on Earth, would reach out across oceans or plains, mountains or forests, girdling the earth if need be, to tap some scene thousands of miles away and reconstruct it in every smallest detail, in every smallest fluctuation of color, so that it seemed to live and its characters seemed to move and do all but talk under the scientific alchemy which brought their forms and colors across an entire world to rebuild them light-wave by light-wave, on the ready screen. Close to the televisone stood a control panel, divided into four parts, each related to a different section of the globe, each closely studded with tiny levers and push buttons. Innocent enough though it was in appearance, this panel was the center of a veritable web of force, arraying thousands of varied and invisible beams or vibrations, capable of flashing destruction to any corner of the Earth.

Now, as Savary's fingers pressed down on one of the buttons of the televisone, a scene in far-off China flashed on the screen. At some vast airdrome on the plains of western Mongolia — Chinese Mongolia — now the heart of the great Mongol state, one of the seven states into

● **There is no use in our saying that "this is the greatest interplanetary story we have ever published" for two reasons: (1) readers are becoming immune to that phrase, and (2) we will leave it for you to decide for yourself. However, we can assure you that it is unique in its theme and action, and contains more than one revolutionary idea that has never appeared in a science-fiction story before.**

Even though there is one well-defined plot, there are so many sub-plots that you will find this story thoroughly absorbing throughout. Human elements play into the network of scientific and imaginative marvels so that this is not a cold mechanical tale, but one in which you will live with the characters and participate in their adventures and emotions.

If you are not reluctant to read "The End" at the finish of this tale, and if you do not set it aside in your memory as something distinct and different from all other interplanetary stories, we miss our guess.

which the Earth of 2247 was divided, a feverish activity seemed to be conveying the tension of beings fighting against time and under the threat of destruction. A great power-generating building rose in the background—one of the few left functioning in the world that, for six days, had been cringing under the lash of Knute Savary's might. With an impatient frown, the solitary man contemplated the scene spread before him. Through an orifice criss-crossed with finely stretched wires that continually hummed with the force of some powerful current, he spoke a few, slow words. Their vibrations were caught up and magnified and sped across the carrying air. It was an icy warning to desist without delay from further defensive activities; to dismantle their power house according to orders. It was six days now since first that disembodied voice had flailed across the terror of startled multitudes!

From the first its cold recapitulation of its desires and conditions, its warnings, on whose heels strode grim object lessons, were as terrifying as though they had come from some distant star. It had travelled across the world, a vast and icy dictum, demanding the destruction of all power plants, the surrender of all weapons of defense and scientific protection, the incarceration of all the world leaders within an area, carefully described, over which he possessed complete control. City after city had yielded as he demonstrated his might. Now it was only within the sites of the various World Council buildings that defiance still raised its head.

As the workers on the far-off Mongolian plain gave no sign of heeding beyond nervous starts as the words of warning lashed across their consciousness, the man in the lonely observatory uttered an irritable exclamation. As one who does, reluctantly, what he deems regrettable but necessary, he laid one hand on a lever set in the nearby wall and pushed it slowly down. Somewhere far beneath the laboratory—within the underground recesses of the hidden building—an immense machine began to vibrate. A few delicate touches on a small adjuster up above trained its ether-shaking waves on the distant Mongolian field. They would travel around half the world to center and become lethal only at that designated spot.

Turning from the still normal scene, Knute Savary paced impatiently across the room. A strange uneasiness rode him; some subtle sense of impending danger. His fingers pressed the call bell of the night guards set around the building. Their answering bells told him that all were on duty. Five minutes would suffice them to surround the secret laboratory with a barrage of deadly rays. He looked up at the skies blazing their age-old messages of light above a withering Earth. They were empty of menace. He folded his arms and said aloud to himself: "Another week . . . . at the utmost! And the world will yield. I will be ruler of the Earth. Then . . . ."

A hundred miles away, a dark cylinder of metal slowed the mad speed that was hurling it through the thin and unimpeding stratosphere. The tense-lipped men within it began fastening the straps of their parachutes. A woman . . . . a deathly-white woman, with blazing eyes . . . . leaned forward and pointed. "Beyond those peaks," she said.

● Time passed within the hidden laboratory. The constellations swung across the midnight sky. Idly, Knute Savary switched the televisone finder from scene to scene. It was like an infinite eye, revealing swift sketches of a cowering world; a planet disarmed and trembling rebelliously under the anonymous power of his will. At last, for the hundredth time, he turned the locator on the great, central World Building, but the screen remained blank. Somehow, they had managed to create a power barrage that distorted the finder ray of his own machine. He had not had time yet to discover a way to penetrate it, yet he hesitated at the idea of destroying it. Too many great minds . . . . minds that he might yet find use for . . . . sheltered beneath its roof. Impatiently, he turned once more to the

Mongolian scene. Destruction was becoming a wearisome business.

The airfield flashed back on the screen. A lurid light seemed to play about it, throwing into higher relief the massive and brilliant head of the men who bent above it. The workers had ceased their activity. They were looking upward at a dark and whirling cone of cloud or vapors that seemed to be materializing out of the very air. As they looked, it spread like a widening funnel, a funnel of death and dissolution that swept down upon them in an indescribable chaos of atmospheric frenzy. Men, airships, buildings were blotted out in a second under the nightmare lashings of tortured, disrupted winds, of atmosphere gone mad under the pressure of stratospheric high vibrations. Savary shrugged and pressed down the lever that disconnected the huge machine below. A sudden sound made him swing around.

Ten men — masked against the yellow gas that slowly swirled upward from the bombs they had flung at their feet— faced him across the aimed muzzles of their guns. Behind them, the open doorway was filled with the yellow fumes. One of them cried out.

"Knute Savary! You! It was you! We had hoped to the last that it wasn't!"

The gas had risen waist high. Savary's hand was on the call bell of the guards. There was no answering bell in return. He folded his arms and smiled disdainfully. The gas was chin high! He spoke pleasantly.

"So the World Council wins. I congratulate you, gentlemen . . . . ."

He reeled and pitched forward at their feet. The yellow gas that had overpowered the guards of the mighty laboratory at their posts rose slowly to the crystal dome that meshed the diamond light-shafts of the distant stars.

The Decision of the Council

● Five months had passed. The world had mended its scars. Humanity had picked up the many tiny threads of its existence and spun them, once more, into a complete whole. Its week of bondage had passed into the limbo of unrecoverable emotions, even as the man who had caused it had passed out of their ken. The world, after a brief nightmare, had wakened and resumed its march.

Five months had gone, and across the silver crescent-shaped table of their innermost judgment room, the leaders of the world looked out somberly, even with awe, at the man who stood for judgment before them; a man who had at one time been a whole planet's idol, from whose almost superhuman brain had come nearly all the scientific inventions that had made of the Earth of 2247 a near Elysium, and under whose guidance their generation had covered more ground than any other in the history of the world.

The inheritor of a vast fortune, Knute Savary had bestowed boon after boon upon the world, till, before he was forty, mankind had harnessed nature itself to the service of its will. His mind, a hundred years ahead of its day, had played with scientific conceptions mankind was still incapable of even imagining; the results alone were the gift of a Titan to pigmies. An uncrowned king, he had, in one sudden gesture of titanic ambition, made himself the arch-foe of the world. A foe who, even captive, inspired fear.

With folded arms and granite face, a contemptuous amusement playing faintly behind his eyes, Knute Savary faced his judges. Six months ago they had been his friends, even in a sense, his inferiors. Now, in a voice rendered flat and colorless by strain, the elderly Chinese president of the Council spoke their indictment from the depths of his ebony chair.

"We are not here to tell you what evil you have wrought on the world, nor of the wrongs you have meditated and almost achieved against your fellow men, Knute Savary," he said slowly. "To your titanic ambitions and overweening pride we could have nothing to say. You who have been the idol of our world have sought to make yourself its tyrant. If death has always been the just portion of him who sought the destruction of the lib-

erty of one state alone, what other doom is fit for the being who plotted to enslave a world? The destruction you have wrought, the slaughter of those you sacrificed to your insane lust for hitherto undreamt-of power, has earned you the execration of the world. But we have tried to be just. We have not forgotten all that the civilized world owes to the fruit of your mind, and we feel that the earth must hesitate before inflicting death . . . . however richly earned . . . . on the man who has given it so many priceless boons. Despite ourselves, we feel that the irrevocable destruction of a mind like yours would be a terrible thing. It may be centuries before humanity conceives such another one. But while you remain on Earth, our shaken planet can never draw a peaceful breath. Even while the thought of your betrayal of humanity's trust, of the destruction wrought to satisfy your ambitions alone, was still fresh in every mind, the very secret of your place of imprisonment had to be kept so securely hidden that it was only by burying you in the very bowels of the earth that we could feel secure against what the power of your mind, aided by the fidelity of your followers, could do. Though we kept you away from the sun for ever, such a brain as yours, swayed by the insanity we now know lurks there, would keep the recurrence of the danger we have just escaped always imminent. Only one other course lies open to us between death and this perpetual uncertainty, and that is exile. Exile from this world, this planet! A banishment into the stellar void, more awful perhaps than death itself, perhaps no more than a postponement of death." He paused, and a deathlike silence weighed on the room. Still more slowly, he continued.

"The *Victory*, the stellar vessel which we have learned you were building with an eye upon the conquest of Mars, once that of our world was assured, is being completed and commissioned after your own plans, in your own dockyards. It is moreover being treated with repellum, the alloy you yourself gave us, which, when fused with metal and then activated by electricity, renders the metal so repellent . . . . to use the word which gave name to your substance . . . . to the mysterious, chemical properties of the Earth that it is hurled violently away from it into space. Thus we shall insure against the possibility of your ever returning to this planet, as the moment your ship arrives within a certain distance of this world, the antipathy it possesses for repellum will cause it to fling you away like a stone from a sling. Mars, being of nearly the same chemical substances as Earth, is also preserved from the danger of your presence. We are giving you means to somewhat moderate the violence of your departure from the Earth . . . . braking rockets as well as propelling ones, and within the ship we shall place every known apparatus for the preservation of life in the stellar void: atmospheric generators, food in condensed form for a lifetime, machinery for creating water, clothing, weapons, scientific instruments, a library, and such other luxuries as we can install. In a month from today all will be ready. You are free . . . . if the awfulness of this exile moves you to it . . . . to ask for death instead. The Council recognizes the right of any human being to choose death rather than banishment into the pathless void; but if you do not . . . . and we who have known the old Knute Savary, the Titan who stood among us till ambition made him our foe, believe that the thought of even the stellar wastes themselves will not overawe him . . . . then, in a month from this day, you shall be placed secretly on board and hurled forth to whatever fate destiny may decree."

His voice grew colder, more passionless, as he paused again, then resumed. "Savary, Chicago lies in ruins, a grave for its many dead, because you made it an object lesson to the world that failed to bow to the first edict you sent out to it. The hurricane . . . . or worse than hurricane . . . . you concentrated there, through some unknown control of the air currents above our globe, cost the United States of North America seven thousand lives. Half of Holland's most fruitful lands lie be-

neath the sea, because its government defied you. How, from your hidden fastness in the heart of the Andean mountains, you achieved the disintegration of its dykes, you alone know, but not all the discoveries you have given to the world can weigh equitably against the destruction those you kept in reserve for its conquest wrought. If your hidden retreat had not been betrayed to us we should now be an enslaved planet lying beneath your heel. Only a whim of fate discounted the cleverness of your calculations . . . . a whim that might not interfere another time. You are a danger that no world can afford to harbor. We leave you the outer, unexplored void, the trackless spaces, as your realm. Death may await you there, or some world, perhaps uncharted, receive and welcome you. The atmospheric generators on the *Victory* should function properly for a hundred years at least, and if no meteor wrecks you or hostile race overwhelms you, you may live out your life safely within its hull. But to the Earth you will never return. The outer heavens you can fashion into a domain for the ambitions you sought to weld, like shackles, on the planet of your birth, but that planet itself shall pass forever beyond your reach. Is the decision just . . . . my one-time friend?"

● Seven pairs of eyes probed the steel-gray glance of the prisoner as the Council waited on his words. It was an awful doom . . . . and as he had said, worse, perhaps, than death . . . . which they had just pronounced, but not a muscle stirred on Knute Savary's face. He had played with the ruling of a planet as his goal, with two worlds as his ultimate ambition. Such a man could out-face all fates. Coldly now, he said: "It is ingenious. Had my plans prospered, I would have made of this world a place a hundredfold better than it now is, but . . . . as far as your decision goes . . . . my one-time friends . . . . it is just. May I make a request?"

"We will listen."

Savary's eyes played over theirs for a moment before he spoke again.

"First, I offer a bargain. I will give you the secret of the ray that can dissolve earth or rock like butter; the ray I used against the Dutch dykes by means of a stratosphere-ship sent there by night. I will also give you the method of creating atmospheric vibrations of unparalleled intensity and of centering them at any given point, by which the hurricanes I loosed upon Chicago were created. Both these inventions have other and more peaceful uses. In exchange, I ask that the contents of my laboratory, as well as the full list of chemicals and apparatus which I shall give you, shall be placed on board the *Victory* to accompany me on my plunge into the void. Now, my request. When I am gone, those who served me will be harmless to interfere with the existing order of things. Many of them count among the best scientific experts of the world. I hope you will free them of the burden of my deeds. In their own way, they were working for the greater good of this planet." He paused and added slowly, with an enigmatical smile, "Perhaps for its salvation? A few years from now will tell . . . . but I shall not be here to know. By the way . . . . this is mere curiosity . . . . it was by treachery that you found the secret of my hidden laboratory, was it not? Only some one wholly familiar with its weapons of defense could have led you through the protections I had set around it. Only a half-dozen men were in a position to know them. Even now, I believe that none of them would have betrayed me."

After a brief hesitation, the Chinese president answered. "It was through treachery. But not that of any of the men with you. Some one who had been employed in your laboratories, and who had learned there more of your plans than you knew, betrayed them to us."

Savary shrugged. "The human equation is the only one that cannot absolutely be predicted by slide rule and formula. It was regrettable that I could not dispense with it. I do not think that it will worry or betray me much in the future to which you send me."

"Exile is then your choice?"

The prisoner bowed sardonically. The old president said slowly and somberly: "In a month, then, from today, at dawn, you shall leave the Earth .... and may the starry voids have mercy on you, Knute Savary."

At a motion of his hand, guards stepped forward. Doors swung ajar and clanged behind the man who had almost conquered the earth. The old celestial leader sighed heavily.

"We are banishing a man greater than all of us here put together," he said. "Centuries may roll by before the world will know another mind to equal his. It may be that we are hurling the progress and inventions of a hundred years into cosmic space. It is a heavy price to pay for that old word of 'Liberty.'"

Many miles away, a woman, hardly more than a girl, sat staring at a small bottle of deadly poison, and at the heat-ray gun laid beside it. Nights of haunted remorse and tortured days had barely dimmed the exotic beauty of her mixed Russian and American blood, the beauty that Knute Savary had never noticed. Behind throbbing temples, the scientific brain that had made her one of Savary's culled employees still fought weakly with the tormented passions of her soul. Under her hand lay the emblazoned thanks and honors from the World Council, sent to her for having saved the world. It was addressed "Nadja Manners." Across the name she had scrawled "Judas" in shaken letters. Slowly, she reached out for the gun, then paused. Slowly, she seemed to gather herself into some cold, hard place of purpose and thought, to congeal even in the heat of her passion and longing for death. A purpose had formed in her mind.

CHAPTER II

Exiled Into Space

A red dawn brooded over the chill mists of an autumn world. It was half an hour before sunrise. From the shroud-like clouds that were already thinning with the approach of day, a rocket plane streaked out of the stratosphere to which it had taken as a final precaution against any attempted rescue of the man it carried, and fell like a plummet towards the gray walls of the enclosure where the greatest space-ship ever yet made on Earth lay in the slips ready for launching.

There was a perfect landing. As Savary stepped out from the small steel cylinder, the sides of the mighty space-ship rose, like a towering wall, barely fifty feet from him. The dynamos that were to generate the electrical current necessary to waken the dormant power of the repellum plated on the hull throbbed already in anticipation of their duty. Some distance off, the seven presidents of the Supreme Council stood waiting with faces palely composed and stern, in the strange dawn-light. Without the high gray walls, an unwarned world slept peacefully, already grown tired of staring and pondering over the silent pile of the great enclosure, of whose one-time owner's fate and possible penalty none knew.

As he stepped forward into his first glimpse of sky and earth in six long months, Savary stopped and swept the misty heavens with a thoughtful glance. If any thought that this was the last he would ever see of the pleasant green planet on which he stood clutched in full awfulness at his heart, the arrogance of his mien and carriage gave no hint of it. With folded arms, he stood looking around him at the strange dawn scene. Gray walls that shut out all view, save the still unlit skies; a long cylinder of gleaming silvered hue, faceted like a diamond and finned like some gigantic shark; the armed and tensely watchful guards; the small group of world leaders, gray-faced in the growing light, grim under the sense of the doom they were inflicting, watching the man whose mighty brain had made the world of their day with all its scientific miracles and harnessed natural forces; that was what he saw as he took a last farewell of the earth.

A small door stood open in the flank of the ship. The American president,

Lewis Hart, waved towards it. His face was strained. Savary and he had attended the same university. Until six months ago, they had been friends . . . . as much as any one could be friends with the brooding power that drove Knute Savary ceaselessly, like a restless dynamo. He spoke.

"Would you like to verify the presence on board of all that you requested?"

Savary nodded. He disappeared within the mighty hull. Behind him silence reigned, and in the waiting void, the rolling Earth slowly turned towards the advancing arms of the sunlight. After an interval, he emerged and his lips unclamped. "Everything is there," he said briefly.

The old Chinese president walked up to him and extended a hand that was icy cold and tremulous. Savary touched it impassively. The six others repeated the ceremony in a silence as heavy as lead. Then Lewis Hart spoke: "Exactly ten minutes after you close that door, the electric current will be run through the repellum plates and the braking rockets turned on by means of a switch from without so as to assure their perfect synchronization. They will help retard the violence of your departure from our atmosphere. You should be well beyond the moon before your propelling rockets need be called into use. The usual drugs are at hand in the control room to mitigate the effects of acceleration. Good-by and . . . . fate favor you."

Savary looked upward with a slow, sweeping glance. His chest expanded. This would be the last time he would draw the keen, sweet air of Earth into his lungs, the last time he would see the dawn clouds flush before the coming of day above his own world. As he looked, a spear of gold touched the top of the high walls, the mists thinned, a bird sang pipingly. For a moment, something strange and hesitating softened the granite-like arrogance of Knute Savary's face. His eye embraced what he could see of the fair dawn world, and he hesitated as though about to speak.

Then his eyes hardened once more. He looked at the men through whose agency he, who should have been master of two planets, would in a few minutes be the most awesome of exiles . . . . a wanderer through eternal space. He spoke, but in a different, sardonic vein.

"When I am gone," he said, "bid your scientists . . . . such as are left . . . . work hard if they would save the earth from death. What use will your liberty be to you when your planet's lifeblood has ebbed away? This world is doomed. Doomed to the same, cold death from which so many other worlds have died. Stricken with the disease that left them mere corpses of the void. You have one generation yet, perhaps two, then it will be too late. I could have saved you . . . . but this world is no longer my world . . . . bid your little scientists save you if they can."

The silvery doors clanged behind him. The purr of the dynamos rose. Men sprang to cast off the steel mooring ropes binding the giant hull to earth. At remote levers, other men awaited, their eyes on the electric metronome set in the control board before them. Ten minutes slowly ticked away. In the minds of the seven who waited, a frantic voice cried out to hold the orders that should speed the space-ship out into the void. There was still time to save a human being . . . . a man at one time idolized by all, the greatest mind their planet might ever know . . . . from that awful doom to which they had condemned him. Each man knew that for nights, even weeks, the thought of that solitary figure speeding through airless space, beyond the orbit of the earth, would haunt their slumber and their waking hours; more! To those who knew Knute Savary, his parting words had an import they could not disregard. His brain . . . . a century at least ahead of those of all the living men of the day . . . . could easily, they knew, foresee a fate that other scientists might remain blind to. In casting him forth into the stellar spaces, they might be flinging away the one chance Earth had to save itself from this unknown doom he foretold them.

As they waited, while the inexorable

minutes ticked away, while men waited, straining for the signal to press down levers and release switches that would send a human being spinning out into the meteor-haunted void . . . . a dead or living projectile of the skies . . . . they asked themselves, frantically, whether they should not regret forever after what they had done. What were Savary's legacies of science compared to what he might still give the world?

Then, as the light of day mounted against the sky, their purpose hardened. Across their minds sped all the terrors that had been compressed into the six days that had seen an enslaved world. Each could recall only too well the night when, without warning, all power and light had been extinguished throughout the capitals of the world, leaving a crippled civilization and a panic-stricken people, across whose terror the vast, magnified voice of an unknown being had struck like a flail. Each could recall the days and nights that followed. They read their final decision in each other's eyes. Come what might! They could make no barter between liberty and life.

● Eight minutes had sped. They bared their heads. Nine minutes . . . . the guards stood at salute. The Chinese president raised his hand as a signal. A gun boomed. The space-ship in its towering speedway seemed to tremble a little, then fire flamed and crackled in livid waves over its silvery hull. A mighty, hissing sound . . . . like thousands of serpents let loose . . . . flowed through the convulsed air. Rockets flamed and roared from the soaring nose of the great cylinder, and, simultaneously . . . . as though flung from some giant's sling . . . . the space-ship rocked upward in a tormented frenzy of flight. In the vortex of maddened air left in its wake, the spectators reeled, blinded and dazed, while even their thoughts seemed bruised and breathless. Those whose minds could still register impressions saw a flash of silver gleam like some rising star in the first sunbeams. A flash that sped outward and upward and away, and ceased suddenly to be as the blue gulf above swallowed it forever in its endless depths.

* * *

Within the compact control room at the heart of the great space-ship, its solitary occupant lay unconscious in the straps and paddings of his seat, as the vast cylinder roared skyward. After a while, he stirred and lifted himself painfully to loosen the clips that held his straps in place. The indicator on the board in front of him showed that the braking rockets were working at full strength. The speed computer showed that they had counteracted even the terrible power of the repellum. Acceleration was now within the limits endurable by human flesh and blood. Leaning forward painfully, Savary took a capsule that had been placed near him in readiness, and broke it into his mouth. Before strapping himself in the chair, he had taken the drug that Earth's few experiences with space-flying had proven effective in that it produced a torpor that did much to reduce the harmful results of acceleration on the human frame. The capsule that contained its antidote now sent the blood coursing once more through Savary's throbbing and tortured limbs. In a minute, he found himself able to swing the lever controlling the view-plate downward towards the planet he was leaving at a dizzying speed. For a moment, the mirror-framed square of the view-plate flamed blindingly with the untempered sun, then the great curve of the Earth swam into view; a misty plane of blending colors, against which the outlines of a continent—Asia—etched itself weirdly.

With a still intensity, the exile stared at the last glimpse he was having of his parent globe. The Pacific ocean sparkled . . . . though its sparkle was unseen at this distance . . . . as the warm sun lay across its bosom. A wide band of clouds, probably hundreds of miles of them, draped itself like a scarf across the location of the Isles of Japan. The earth dimmed and blended its colors like an opal; its disc seemed to contract, to swim completely, now, into the small dimensions of

the view-plate. As he looked, the white-capped poles slipped into the picture . . . . the Earth swayed in the black void of eternal night like an opalescent globe, veiling and unveiling herself in her clouds. Continents blended with seas, the world was only another planet rotating in the airless cosmos, but her call still seemed to reach across the void, plucking like an exquisite agony at the heartstrings of her son. The man who had believed himself intellectually above emotion felt the call of the planet that had conceived him, winging its way across space. When he straightened and raised his hand, at last, to his forehead, an unexpected perspiration bedewed it. He had no knowledge of how long he had bent there, over the dwindling orb that had been his home, that he would never see again.

Hour after hour, the *Victory* hurled itself outward on its goalless voyage. Savary switched off the braking rockets. Soon he would be passing the moon, last outpost of his one-time world. Now all that arrested the eye, as he looked through the view-plate, was the star-beaconed darkness of space, or the unbearable brightness of the sun, flaming amid twisting tentacles of fire to the right of the ship. Even as he shot through the void, the heat of its fierce heat energy was being stored in the reservoirs for solar heat, from which it was distributed to the various mechanical units of the vast and complex craft. It was Savary himself who had given to the world this greatest of all motive forces . . . . solar power. In conjunction with a new metal, discovered in the previous generation on the moon (space-travel, although not yet past the experimental stages, had been inaugurated in the previous century, it had rendered space-navigating practicable, instead of merely possible. Communication with Mars had been established ten years previously but had not, as yet, become other than a daring adventure. Nevertheless, solar heat, as a fuel, had opened the pathways of the skies, and it was the man, who now had no other home than these cosmic ways, who had made them free to Man.

● The *Victory* represented what was probably a century's advance on the previous type of space-craft. Savary had spent all his Titanic genius in designing it, and it was, beside the other ships used in interplanetary travel, as an ocean-liner to an old-fashioned sailing ship.

The hull over which the repellum had been laid and fused on was of an elastic metal that had fifteen times the resistance of steel. The impact of a meteor would bend it, but it would need a collision with a minor planet to shear through the three thicknesses that formed its protecting wall. Everything about the ship showed the unparalleled genius of the man whom it was destined to bear to a stellar exile. Savary had calculated that, with a crew of picked men, the *Victory* could have conquered Mars alone, without other help. Would it serve him safely now, as a home and protection in the vast abysses of space?

Within, the ship was evenly divided into three parts. Encased within its triple shell, the heart of the arrowy craft held the control room from which radiated the nerves of its subtle machinery. In the fore and rear parts were the store rooms and what had originally been intended as quarters for the crew. However, the dividing partitions had been torn out of these latter and a vast and complete laboratory installed, flanked on one side by a workshop for cruder and more mechanical work, and on the other by a library and arsenal.

The whole inner part of the vessel was built around a highly magnetized shaft that served to establish a sort of artificial gravity, effective save when the ship was at absolute right angles to a planet. On each side of this central shaft, and protected against accidents by the outer rooms already described, were the cells housing the machinery; room after room of highly specialized parts, each in duplicate in case of accident, and additional store-rooms for such vital supplies as the chemicals required for making water and purifying and revitalizing the space-ship's atmosphere which was thus rendered self-renewable. A small, but complete, astro-

nomical observatory occupied the nose of the craft, while Savary's own spacious and commodious quarters were placed in the rear.

The space between the inner and second shell of armor surrounding the ship housed the machinery motivating the deadly armament Savary had designed for it. Some of this had remained incomplete, since the secret of them was unknown to the World Council, but Savary saw that it would be a simple matter to complete them and surround the *Victory* with a barrier of the most deadly rays. The Council had spoken truly when it affirmed that, beyond exile and the chances he might encounter in space, no rigors that could be avoided had been imposed upon him. Every conceivable necessity for his comfort had been supplied in quantities sufficient to last a lifetime. Nothing was lacking; there was food in condensed form, clothes and books and luxuries, as well as raw materials and chemicals, metal ingots, machinery parts and welding and casting facilities in every imaginable form.

When the moon floated, like a milky agate, behind the *Victory*, Savary knew that his last link with Earth was gone. The immensity of the airless skies and burning constellations enwrapped him. Night and day were one. For long hours he worked in the observatory, making notes of the stellar phenomena continually unrolling before his eyes, taking minute photographic studies of the wonders spread, like an ironically opened page, before eyes that must need keep the knowledge gleaned from it for themselves alone. When, at last, he had charted the skies around him and filed the spectroscope of each flaming sun away for future reference, he turned to the complex wonders of his laboratory. Mars' orbit sped past, her dying world . . . . a red glow afar . . . . melted into the myriad blazes through which the *Victory* sped on her returnless trip, and the man who might have been the ruler of two planets, worked through the blazing nights and days . . . . each alike and each unchanging, save in the pattern of the constellations that swung past the glassite roof of the observatory . . . . over the most immense of all his achievements.

Among the Asteroids

● During his last weeks of imprisonment, Knute Savary had charted the days and nights in imagination . . . . the lifetime of days and nights . . . . of his future exile. He had foreseen the pressure that the endless shining of stars out of airless night, the endless flight of his lonely vessel through the unsentient void, the endless repetition of solitary hours would exert on the fortitude of the human mind. He had thought that loneliness would end by becoming an almost actual presence, a sense of horror, preying on him as it had preyed on men abandoned on desert islands, so that they went mad. He found now that this sense of loneliness was only an intermittent thing. He would wake from sleep . . . . the light sleep he took at regular hours only through the need for some routine by which to regulate his life . . . . with an odd feeling of companionship lingering with him like the aftermath of a dream. Solitude, a solitude beyond earthly conception enveloped him. The silence of the stars, of airless space, beat in day and night against his brain, but the sense of contact with his own kind seemed, as yet, to linger on within the vessel that bore him upon that mad and flashing flight.

The space-ship, once its course was set, needed but the minimum of navigating. Past Mars, Savary had turned on the propelling rockets till the speed of the vessel was nearly quadrupled and had set its course in the direction it had taken on its leap away from the earth. Nothing called him to any particular point of the solar system. All time and all space were his and no goal was in either.

One night he awoke sharply from his usual light sleep to find the space-ship reeling under the impact of ceaseless and implacable blows. He had flung himself down on a couch built into the side of the control room, as he frequently did,

and in a bare second he reached the frame of the view-plate and bent over it. A stupendous spectacle met his eyes. The *Victory* was plowing its way through a dense swarm of meteors, none of them, happily, of any great size. Dust of dead worlds, they rained and pelted against the resilient metal of the space-ship's sides. Lumps of metal, jagged rocks, miniature asteroids no bigger than a house, they careened and swam out of the night towards him till destruction seemed inevitable under their continuous onslaught.

A few days earlier, Savary had removed a dozen or so of the large heat-ray guns with which the *Victory* was equipped, installing in their stead the first results of his toil in laboratory and workshop—an equal number of giant projectors of the disintegrator ray he had used against the Dutch dykes. As his spacecraft reeled under a more vicious assault than had yet occurred, he swung the levers controlling them into position (the ship's armament was operated from the control room as well as the outer passage) and bent interestedly over the view-plate. A unique spectacle flared up before his eyes. For the first time in cosmic records, a man-made annihilation wrote its achievement on the vast page of space.

Destruction had swept itself like a veil around the hurtling ship. The great rays, shortened and broadened to fanlike streamers of barely perceptible light, seemed to reach out like ghostly fingers for the swarming meteors. A touch, and rock after hurtling rock glowed and dissolved like butter melting at the touch of flame. Back and forth, Savary manœuvered the sweeping, crossing rays, dealing instant destruction to matter that was as old as the solar system . . . . older, perhaps, than the earth. As the *Victory* plunged forth from the remaining meteors, he straightened with a brief laugh and switched on the lights.

The interior of the space-ship glowed warmly and comfortably, a startling contrast to the airless black without. For the first time, Savary felt a sense of homeliness about its metallic walls. Tracing the location of the *Victory* idly on the great wall chart of the skies that hung above the control-panel, he paused as a sudden thought struck him. For the meteors to have thus assaulted his vessel meant that their substance must have been immune to the effects of the repellum fused into the ship. The repellum itself probably accounted for the fact that these were the first wanderers of the void to approach the aimless voyager through space.

He checked his position more carefully on the chart. Hitherto, he had done so without any particular interest. Now he saw that the present course of the *Victory* would take it, within a few days, directly across the orbit of the inner asteroids, those Lilliputian worlds without number which roll like a river of cosmic pebbles between the inner and outer planets of the solar system.

Perhaps, he told himself, the swarming meteors he had left behind were fragments of this planetoid stream. If so, somewhere amongst them were tiny worlds, immune to repellum, on which he might land. A sudden reluctance to go farther from the planet he had called his swept over Knute Savary as he pondered this. Why should he not pause, if it were possible, on some larger asteroid? What lay beyond to draw him farther from the tiny disc of Earth? Nothing. The unfinished giants of the solar system seemed at the moment too unlike the planet of his birth to attract his lonely mind. In any case there were years ahead of him . . . . if no hazard of space interfered . . . . in which to turn in their direction. Of time he had an ample provision. With a sudden decision, he steered the nose of the space-ship away from its outward path, in a course that would slant it into the asteroid stream in the same direction as their orbital movement around the sun.

● Slowly, the sun had diminished to almost half its size, a fiery beacon that burned unrelentingly in the space-vessel's wake. Day and night followed the arbitrary march of the clock's needles across the figment of the hours. In reality, day

and night had no existence out here where night was eternal and the sun a constant burning torch. The march of the stars blazed silently and icily across the trajectory of the hurtling ship, poised above a man-made time. Within the space-craft, Savary timed his life to an inflexible routine; food, sleep, exercise, the incidents of stellar navigation, astronomical observations and records, finally, and most important, the hours given to his laboratory, where in the silence of the stellar night and the emptiness of all life around him, his mighty brain worked out a challenge as great as the cosmic law it defied.

He had set his mind on one special problem: a problem seemingly beyond the reach of man. Before the speeding *Victory* had borne him to the edge of the asteroids' orbits, its equations lay, seemingly, solved before him, needing only the test of actual demonstration to establish it as a fact.

That day the powerful telescope of the observatory picked out the moonlike gleam of a small planet from the starry depths ahead. After some calculations, Savary turned on the braking rockets to decelerate the frantic speed of his flight, and settled down to a patient and systematic investigation of the course ahead of him.

Soon, other luminous dots outlined themselves against the sights of his telescope. On the evening of the second day of deceleration, four small worlds . . . . none of them even approaching the moon in size . . . . were visible to the naked eye. Slowly, they drew nearer; outlines of jagged crests and somber hollows became clear. Savary settled to a sleepless vigil at the controls.

The first planetoid was drawing close when the man watching her felt a drag in the space-ship's speed, as though it were fighting against an actual obstruction. Reduce the power of the braking rockets as he might, the drag persisted, became more pronounced. What was happening was clear to the man at the *Victory's* helm. The small world ahead of him was as hostile to his vessel as the earth itself. Its size was too slight for it to fling the space-ship away from it as the latter had done, but its small mass was inexorably and slowly repulsing it. Even the velocity attained in the long flight through space, would soon be insufficient to combat this antipathy of the alien elements for repellum.

With a sharp frown, Savary swung in a wide arc to aim his ship at the farthest of the visible planetoids. No more than a few hours of space-flying separated it from the first. But as he approached it, the same phenomena began to be felt. Once more, Knute Savary deflected the course of the arrowy ship. In the blackness ahead, other, unseen, Lilliputian worlds were hurtling, he knew, towards him. With rear rockets singing, he went to meet them. Surely, among all that dust of planets pouring through the skies, some would be found whose elements would welcome, not repulse him, and yield at least a landing place, in his exile of space.

As he sped, he saw that, to right and left, the sun was palely illuminating small masses of jagged rock and molten metal; flotsam and jetsam of some immense planetary wreck, condemned to hurtle indefinitely through the cold desolation of the void. But not till another two hours had passed did he sight a mass of any considerable size. This was a planetoid about half as large as the moon, around which two satellites, mere pitted lumps of rock no bigger than Florida Key, circled in a slow march. Another two hours, and the asteroid filled two thirds of the view-plate with its gleaming disc. As the *Victory* plunged towards it, Savary waited tensely for the first indications of antipathy of its mass on the homeless ship, but instead, a slowly increasing pull began to make itself felt. In the readings of the delicate instruments on the control board (instruments so perfect as to make the *Victory* nearly self-piloted) gravity began to register . . . the attraction of an approaching mass on the small rover of the void. Next, the warning note of the rocket bell rang softly, and the braking rockets automatic-

ally slipped into action as the clutches of the planetoid reached out towards them through space.

Slowly, the luminous sphere grew and filled the view-plate . . . an airless world, cold, dead and gleaming as a ghost of the skies. Slowly, the *Victory* slipped into her hold and Savary throttled down the rockets to a mere explosive sputtering of flame. In an atmosphere, the finlike wings on either side of the space-ship could be used as supports or gliders, but on an airless world, the rockets were the only means of regulating a landing. Braking with them, he brought the space-ship closer and closer to the meteor-scarred and pitted ground. At last, with a seismic jar and crash that shed no echo in that frozen, airless world, the great cylinder came to a dragging rest.

Going into the observatory, Savary swung the covering plates back from the great glassite roof . . . strong as triple steel but transparent as crystal . . . that formed its inner ceiling. A scarred and lunar scenery met his eyes. Bleak stabbing peaks traced jagged outlines above crevassed valleys. Between two eroded crests, the shrunken sun glowed like an orange of fire, throwing harsh shadows and untempered light on the air-stripped ground. Above him, the two minuscule moons . . . small shields of silver swinging athwart the sky . . . seemed to move at a pace equal to the rotation of their parent globe; fixed satellites which only one half of the planetoid could ever see. With eyes reddened from lack of sleep, Savary looked out awhile on this dead corpse of space; then, reeling a little from the protracted vigil of the last two days, he gained the nearest couch and fell into a dreamless sleep, lulled by a silence nothing had broken for half a million years.

CHAPTER III

An Airless Planetoid

● Savary woke to the harsh darkness of an airless dawn. Night reigned in bitter iciness over hollows and plain, but spear-shafts of sun made beacons of fire of the topmost stabbing peaks. Climbing into the insulated thicknesses of a space-suit, he passed through the successive air-locks of the space-ship and stepped out onto the desiccated soil.

A solitary Crusoe of space, he looked upward at the blaze of the untempered stars, feeling the very life within him a challenge to the unsentient void amid which he stood; a pigmy set down in a solitude such as no other man had ever known, infinitely small, yet *alive*, where . . . for uncounted æons . . . only death had reigned.

Suddenly, the small sun lifted over the jagged horizon and heat and light flamed across the naked world. Odd memories of distant earthly sunrises stirred in the exile's heart. He put them from him to turn and explore this world.

After the slight, artificial gravity of the space-ship, the frail attraction of the tiny planetoid presented less difficulties than had he come to it direct from earthly ways. True, a sudden leap flung the solitary explorer an odd fifty feet or so into the void above, and the small rocket propellers attached to the space-suit were no more than elementary precautions against a weightless suspension . . . for all eternity . . . above the ground, but walking was unbelievably pleasant on this half-weightless world, and an hour's exploration brought him to the brink of a wide sea bed.

A dust of silver sands still slept in its depths. The worn memories of river beds still led down to its shores. This, Savary saw, had evidently once been a living world and no mere lump of mineral matter torn from the womb of some cosmic death. Though the rocks under his feet were of a composition unknown to him, though the desiccated sands had a metallic sheen he had never before seen, this tiny world had possessed, even as the moon, an atmosphere and water, growing things and flowing tides, organic life, perhaps, in some form or other; a life long since vanished with the waters and the air. Brooding in thought of the past this island of space had known, Savary looked up to

where small mountains had lifted vegetation-cloaked brows above some placid sea thousands of years ago. The dwarf moons looked down upon him, an alien on this corpse of the skies. Across millions of leagues of spacial abyss, the pin-point of light that was, he knew, the earth mocked him with its unattainableness, its remembered greenness and life.

Something stirred within him . . . even as in that moment when he had looked his last upon an earthly dawn . . . an uneasiness that was softeningly alien to his cold, intellectual pride; something which he recognized as homesickness, but which he failed to recognize as remorse.

The next morn he assembled one of the small space-cars . . . destined to serve as lifeboats in the original purpose of the *Victory* . . . and equipped it with food and oxygen tanks sufficient for four days. With its small rockets singing their voiceless song of flame, it sped over the surface of the asteroid, barely skimming the higher peaks of the low mountain ranges. In four hours, he had circled the tiny globe. He calculated that it was roughly about half the circumference of the moon. Its period of rotation took a little over nine hours, and, as he had thought, its tiny moonlike satellites completed their own circle of their orbits in close to the same time, so that they were almost as fixed as the mountain tops in the parent-world's sky.

He found that on the other side of the one-time sea he had seen the day before, the land spread out in the crevassed and desiccated remains of a plain; a broad valley that widened between low hills, till, suddenly, it became an amphitheater set among the distant foothills of still more distant mountains and cleft by the worn bed of a broad stream. Here a vast and ordered array of crumbled debris and dust-covered hummocks arrested his eye.

Mooring his rocket boat to a vast, cleft rock, he stepped out and approached it on foot. This, he found, was precarious work. The thick, almost impalpable dust of centuries lay many feet thick at places. At others, the worn backbone of the under rocks rose like a leviathan's ribs, but as he drew nearer, the certitude that life had come to fruition on this Lilliputian world received a full confirmation.

Of no known material or architecture, the scattered ruins before him had clearly been created by some form or other of intelligent life. Buttresses reared from the silting sands. The caved-in roofs of buried dwellings opened debris-filled gaps under his feet. There, a many-planed arch writhed free of the choking dust. Here the upper half of a mighty doorway opened like a gaping mouth before Savary's footsteps. Sand filled it like a petrified flood. Drawing forth his disintegrator-ray tube . . . a small edition of the ones he had used against the meteor swarm . . . he trained the weakest of its vibrations on the choking dust. Like water turning to steam, it melted into nothingness, and a crumbled flight of steps appeared beneath it. An inviolate darkness brooded in icy agelessness within its depths. Switching on the forehead lamp that all space-suits carried, the Terrestrial stepped gingerly down into its clutches. For hours he seemed to descend into the very bowels of this corpse-like world. After a while, the material of which the passageway and floors were built became more discernible and less corroded by time. Scratching it with a knife, Savary saw that it was a sort of green metal, of so fine a grain as to seem surfaced like glass. Turning his disintegrator on it, he was astounded to see the smooth surface remain unscarred. This was some substance not only unknown to Earth but of a molecular composition different from any Terrestrial elements. By what means, he wondered, had the beings who had built this city cut and handled a metal which even the ray that could dissolve all known earthly matter could not affect? A metal of this order . . . if metal it was . . . could outlast even time itself. Even stelumin, from which the hull of the *Victory* had been made, could not compare in tensile strength with this green substance left as a monument to a vanished race of intelligent beings who had tasted of life and achievement when

Earth had probably been no more than a seething caldron of elementary gases.

● Descending deeper still within the airless tunnel he followed, Savary found himself at last in a vast hall whose farther confines lay unrevealed by the rays of his lamp. Here, even the dust of a million years had not found entrance. Pillars of strange fluted design lost themselves in impenetrable darkness. Arched doors opened on every side into winding passages; faded hues gleamed from the sculptured walls. Flashing his light along the nearest pillars, Savary saw that the carvings there seemed to be in the likeness of almost-obliterated figures. These gave the startling impression of earth-like silhouettes. Peering closer, the exile from Earth saw that the defaced bas-reliefs possessed the outlines, at least, of human beings. One . . . a more than usually clear outline of a feminine-looking bust and head . . . had a haunting profile with strange, yet human, pointed lips; odd, curved and flattened nose, shoulders of an almost bird-like delicacy of bony structure and withall a sort of poignant beauty that reached across time and destruction to hold and fascinate the solitary man staring at it. When, at last, he had torn himself from the mighty hull with its memories of a vanished life and had emerged into the starlit night outside, an almost savage elation gripped him. As he skimmed once more above the desert wastes of the dead world, he imagined how those plains and mountains must have looked to the beings . . . so like men . . . who had built the mighty city he had just left, and breathed the air that had seeped away into the void. Could he bring back to them, once more, the verdure and life that had left them a thousand centuries before? The question sang and hammered through his blood. Here was the test his greatest of all achievements needed. He would make this dead planetoid his challenge to the immense and inexorable forces of cosmic space. Out of the icy airlessness of its aeons of sleep, he would lift it into the glow and color and warmth of pulsing life, if his power stood the test of actual experience as it had stood all the theoretical trials he had subjected it to. Beside so vast an achievement, the conquest of Earth itself would appear a small thing.

When the *Victory* rose in front of him, a darkly luminous cylinder of alien metal above the saw-toothed hills, his strong elation subsided, however. The eerie scene swept him suddenly up into its terrible loneliness, its infinite isolation. Across the faceted hull of his space-vessel, the spear-point of light that was Earth flashed its vain call across the void. Now that an impassable abyss sundered him from its fair, green world; now that it was too late to make amends, a bitter horror possessed him at the doom to which he had left the planet of his birth.

Slowly, he sank his rocket boat to a shoulder of rock above the space-ship. Stepping out, he stood on an uplifted pinnacle of the plain, looking out at that distant gleaming pin-prick and felt the vain assaults of a poignant remorse shake even the Olympic coldness of his mind. While he gave air once more to this dead, dwarf world, the doom which had killed it would be stealing over his own fair sphere. A doom he alone of all men on Earth had foreseen and sought a remedy for: the slow leakage of the vital air into the surrounding void. A leakage that had come, he tended to believe, at a set period in the evolution of all planets now rolling as dead and desolate corpses through the cold ways of space, and which probably had the same immense causes. Even as it had destroyed the moon, as it was now destroying the desiccated wastes of Mars, as it had destroyed, in some dim past, this small world he stood on; so was it bringing its cosmic airless death to Earth.

Bitterly now, he wished that he could send across the void the warning and the saving knowledge he had failed to speak clearly of on the morn of his exile from Earth. In the blackness of the star-beaconed eternal night, he looked out towards the distant gleam that was his world and felt all the inexorable width of the gulf

between strain like an agony at the slender cords that bound his spirit to that wavering glow. Across the void, Earth beckoned to him with a strange and powerful call, and the exile felt his whole being answering her vainly as he stood in the most awful solitude man had ever invented for man; the scarred rocks of an alien and airless world around him, the immensities of space sundering him forever from any contact with his own kind.

In that bitter communion with the world he had wronged and lost, the cold and scornful pride that had set his ambitions above those of all other men softened and bent before remorse. It was a long time before he looked down at the plateau whereon the great bulk of the *Victory* rested. It was the impossible, the unbelievable that tore him from his abstraction. A human cry was shrilling frantically through the radio-receiver in his helmet!

At his feet on the plateau, between the rocky peak he stood on and the space-ship, a figure . . . a moving, living shape in a space-suit . . . was running wildly, as though pursued, across the crevassed ground. As he looked, almost unbelievably, the figure stumbled and fell and something still stranger than itself . . . something as invisible yet perceptible as a heat-haze or the ghostly smoke of dry wood . . . hovered for a moment above it, and then blotted it from view.

The Stowaway

● Savary's senses tingled with some wireless impression of menace and alien danger. For half a second, the figure in the space-suit seemed to writhe and half struggle from its almost-invisible foe's embrace. Parts of its weakly weaving arms and body appeared beyond the invisible shadow of the *thing* that enwrapped it; but, even as Savary leaped down towards it with a mighty leap, it collapsed and lay as though dead beneath the obscuring folds of the *something* with which it had fought.

Savary's leap had hurled him across fifty feet of space into the radius of the invisible *thing*. As the impetus of his spring slowed to a last few running steps, he felt a slight resistance as of something elastic break the violence of his arrival. Immediately, an intense and sickening cold struck through the walls of his space-suit. It was as though cold itself, the ultimate of all cold, had taken a body. Yet cold that could be felt through the insulations of a suit built to defy the terrific cold of space was almost past the imaginative capacities of man.

Almost by instinct, Savary's numbing hand pressed down on the lever of his heat-gun. Its fiery ray sprang out in a deadly fan. Around him, the appalling cold shrank and released him. A vague, a shadowless swirling eddied through the airless, sunlit night; then the sense of withdrawal was complete. The thing . . . whatever it was; vapor unsentient and willess, or malign and living matter . . . was no more. Only the black emptiness of space pressed down upon Savary and the unconscious figure at his feet. As he bent over it, a human face glimmered palely through the glassite helmet's front.

Lifting the limp form in his arms, he hurriedly gained the shelter of the space-ship. Once in the air-lock, he hurriedly turned on the valve that let in air from the inner reservoir. Peeling off his space-suit and then that of the being he had carried in, he found himself staring in sharp amazement at what he saw. White-faced, yet still breathing, an Earth-woman lay on the ground at his feet.

In the control-room, he applied restoratives. After a while, her eyelids fluttered and opened. Eyes that changed from a look of questioning blankness to one of strange, shrinking fear, looked up into his. Savary stood staring down frowningly at the suddenly masked face. A teasing sense of familiarity probed at his mind. Suddenly he remembered the brilliant young Russian scientist who had been among his assistants in the astronomical department of the vast complex laboratories over which he had ruled. She had been, he remembered, the only woman he had ever taken on his staff, though women scientists abounded in this modern world. He had generally held that they were emo-

tionally undependable and therefore had no place in the domains of pure reason where science had to be tracked down. Nadja Manners had been an exception. The brilliancy of her record had been too outstanding to overlook. Now, perplexed and feeling his way through a maze of various and unfamiliar emotions, he wondered what reason had driven her to share his exile. If it was faithfulness, it was faithfulness beyond even the fanatic devotion he had, all his life, commanded from those who served him. What the horrors of the departure from Earth, of the long flight through space spent in some cramped hiding place without comforts or change of thought, had been, he could easily imagine. There had been no sight of the heavens such as had solaced him; no cushioned ease to take the edge off the unnatural nights and days. But even as words of appreciation, of gratitude even, rose to his lips, they congealed there. Swiftly, his lightning intuition assembled the missing pieces of the puzzle he had played with on Earth during the long watches of his imprisonment. He spoke with a cold, light sarcasm.

"Remorse, extravagantly manifested, is a woman's folly, of course. When I wondered who had betrayed me, I should have remembered that I had committed the folly of taking a woman on my staff. Was it to make amends, or to ease your conscience . . . a feminine ailment that also . . . that you condemned yourself to eternal exile in my company—and without consulting me?"

In the pitiless silence, the woman dragged herself to her shaking feet. She leaned against the wall. Her beauty had a ghost-like quality. Haggard and worn and cool, she was like something that has passed beyond all passion and feeling. From some cold, inner realm of her own, she looked out at him unmoved.

"You just saved my life," she said tonelessly. "Perhaps, for either of us, such an act is really a disservice. Nevertheless, I am grateful. You would probably have done as much even if you had known who I was."

Savary shrugged. He looked at her curiously. She was very young still, and for her courage, at least, he could have nothing but admiration. He poured out another dose of restorative and held it out to her.

"Any other human being, in this spacial solitude, is valuable," he said. "I wonder why you betrayed me?"

A faint smile played across her pallid lips.

"Because I was in love with you and women were beneath your interest. Hate and love have thin lines of demarcation. There was a scientist within your secret laboratory who loved me and I used him to learn of your plans."

"Love!" Savary smiled contemptuously. "A woman's plaything! But you speak in the past tense."

Nadja Manners drained the glass of stimulant in her hand.

"Small emotions vanish before the exile we face," she said. "You had better make the best of my presence here. I never imagined that it would be the choice you would have made yourself, but I will not be wholly useless. Two can outface many hazards of space that would overwhelm one . . . however resourceful."

"How did you get on board?"

"You probably forget that I helped design the plans for the astronomical observatory of the ship. This made me familiar with the plans of the ship itself. When I learned that the *Victory* was being completed, I guessed the purpose, and it was easy to slip down in a parachute suit from a plane driven over the yards in the dead of night. Once within the ship, it was child's play to find a hiding place in one of the storerooms already stocked. During the flight I sallied out only when you slept. Today, when your absence prolonged itself, I grew anxious and found a spacesuit with the intention of going in search of you. I had hardly left the ship when I felt the sensation of being watched. Then . . . although I was facing the sun . . . I saw it disappear, and I had the feeling that some malign presence was drawing near

me. I turned back to run to the ship and . . . the rest you probably saw. What —what do you think *it* was?"

"Evidently a being that exists without air. We have always speculated as to the possible existence of such things. It is probably only perceptible to us through some of our less recognized senses. Clearly, it is beyond the range of our vision, though it is opaque to light. It may deflect light in a manner unsuited to the capacities of our retina . . . probably in a sharp curve or angle. There has always been a theory concerning the possibility of objects being rendered invisible through this manner, if a method of attaining it were ever discovered."

"But I saw it," the woman protested with a shudder. "It was at least partly visible."

Savary shook his head. "That was probably no more than the collaboration of your other senses. The attributes of the body are interdependent and the united sensations of whatever senses this *thing* registers on—the psychic senses, probably, since nearly all others are nullified by an absence of air—possibly had the effect of auto-suggestion on the eyes, making the creature almost visible to them; just like a smell may almost conjure up an image to the view."

The girl shuddered at the memory of the icy clutch from which she had just escaped. Weakly, she lay back against the cushions of the couch. Savary stood looking down at her. The airless world of the asteroid etched itself in harsh contrasts of shade and untempered light on the view-plate lifted above the control panel. He contrasted it with the last night of almost Olympic power he had spent in his laboratory in the Andes. It was this frail creature before him who had wrecked his Titanic plans and condemned him to an exile whose bitterness he had only just tasted to the full. But the thought that he, himself, had betrayed more than one single man through the bitter silence he had kept . . . a silence through which the world itself must die unless he found a means of bridging the immense gulf between them . . . softened the harshness of his judgment of her. For what she had done to him, he could forebear enmity . . . lions do not nurse resentments against gnats . . . but his deep-rooted scorn of her sex remained with him. He had been unaware of her love for him; it would not have interested him in any case, though she had been on Earth a lovely, brilliant being with a savage beauty that belied the highly civilized capacities of her mind. As an intellect, he had considered her worth using. He was scarcely astonished now that she should have been the one to destroy him. He had once said mordantly: "In every edifice man's mind has built, there has been a weak prop or faulty pin, and its name is Woman." Nevertheless, the presence of another human being here in his exile was an invaluable solace to that inhuman loneliness that had pressed upon him out there under the icy stars. What she had said was just. His scientific experiments would be facilitated by a helping hand. The very relief of speech would prove a safety valve for his mind. He had no sympathy with such emotion as had driven her to share his fate in some wild extreme of expiation. But since they were to live a lifetime together, he had no hesitation in voicing those advantages he saw in her presence.

"You will be useful," he said coldly. "At least, you are a scientist yourself, even though a women. Together we should accomplish some things that would have been hard for me to execute alone. I owe you no gratitude for having come with me, though I have a certain appreciation of your courage, but I admit that I have something to gain from your presence, though that of a man would have been more useful."

The girl stood up and walked across the room to the view-plate. Her large, brilliant eyes burned, but her voice was even more emotionless than the man's. She had expected even less than this, and in the endless, tortured days on board the *Victory*, she had set and tempered her resolution.

"You will find me as useful as a man,"

she said. "I am very strong, and the next time I go forth upon this world I will see to it that I am armed so as to meet dangers without depending on you. What if there are many of these *things* on this asteroid?"

Savary frowned and remained a moment in thought.

"We could fight them more easily if we could see them. I wonder . . . I have an idea. Tonight I will work on it. Choose yourself rooms in the forepart of the ship. You will find there enough clothing for you as well as myself. The Council provisioned me thoroughly. You can probably adapt them to your size without much expenditure of energy."

He disappeared into his laboratory. When he emerged, the airless night had settled down upon the Lilliputian world. Soft lights glowed in the spacious control room and warm food steamed on a side table. During his solitary flight, Savary had lived on the food tablets used on earth for trips where supplies were hard to carry, and which provided a balanced ration in a space-saving presentment. The *Victory*, however, was equipped with condensed provisions of more appetizing foods, and of these Nadja had, womanlike, made a savory meal whose aroma and taste made the interior of the space-ship seem suddenly a more home-like place. Her impersonal manner pleased him. She might have been another man. Her manner ignored the past. Over the meal, he told her of his discovery of the ancient city.

"Tomorrow we can explore it further," he said. "And by then, I may have something made that will make it possible for us to see any creature such as that which attacked you today . . . if there are others about."

CHAPTER IV

The Ancient Race of Speira

● The next morning, when Nadja Manners came into the control room, she found Savary holding two pairs of odd-looking spectacles in his hands. He handed one of them over to her. They were made of some new transparent substance, a crystal of a kind she had never seen before . . . darkly rose on the surface, yet with an effect of other underlying colors beneath, as though many sheets of thin, vari-hued crystal had been superimposed. The upper part of each spectacle was transparent and of ordinary glass, but on looking through the lower half one got the strange impression of gazing through a kaleidoscope into a realm where strange shapes and colors moved with shadowy vagueness.

Although sufficiently transparent to filter light . . . though in a strange, distorted fashion . . . it was impossible to perceive any of the objects in the room when looking through it. Turning it around and around, she lifted inquiring eyebrows at Savary.

"It will have to be proven by use, of course," he said. "But if the creature who attacked you owes its invisibility to the causes I imagine, this little bit of crystal should help us to see it. I worked over it all night. As you see, the light rays reflected back from the objects around us do not penetrate it . . . not because it is not transparent enough, but because it is constructed so as to transmit and straighten only rays that are distorted or bent along certain, defined angles. It will probably not give a full view of the creature we dealt with yesterday. If its dimensions are too large, we will only perceive the center of it, for the glass can only catch those rays whose deflection is not too far removed from the normal range of the human eye. So as to make ordinary visibility possible when they are on, I have made the upper portion of the spectacles of ordinary glass, and the lower of this substance, which, by the way, is a composite of the finest lunar rock crystal, superimposed in thin layers and containing some of the principles of the prism, only it is not the composition of light which we break up, but its curvature. Of course, the *thing* that attacked you yesterday may conceivably reflect light rays in an angle or curve that this crystal cannot intercept . . . that will have to be seen. But if so, I believe that it will not be impossible to

modify the crystal so that it acts on a different set of angles or curves."

"What makes the effect of superimposed swimming colors, as though you were looking into great depths?" the girl asked curiously as she handled the strange substance.

"Imprisoned gases. You have seen a stick's reflection distorted under water? The effect of these condensed gases held between the crystal sheets is distantly related to this distortion. Now, let us be going."

The small red sun was approaching the horizon when they drew near the half-buried city of the dead. The five-hour day of the tiny world had been already half-sped when they had . . . or rather, Nadja Manners had . . . awakened. Now the dark peaks were stabbing upward towards the distant parent orb. The sharp shadows of an airless world were lengthening across the dust-buried plains, and as they reached the immense, half-cleared doorway Savary had discovered, they switched on their forehead lamps.

Within, the unchanging darkness of a million years hung like a palpable presence. The great hall seemed like a tomb of ghosts . . . ghosts grown weary, across the centuries, of haunting, even with their memories, the forgotten ruins where they had dwelt. Leaving Nadja to examine in detail the carvings and hieroglyphs on pillars and walls, Savary started to use his disintegrator carefully on the dust-choked doorways. Behind them, inky passageways stretched out under the silted earth. Suddenly, his radio-phone hummed with a sharp exclamation from the girl.

"These are ideographs interspersed with conventional signs," she cried out, "writing that has crystallized into more or less of an imaged form. I have already made out the conventional sign for 'death' and 'speed.' Unless the mentality of the people who carved them does not diverge too sharply at some given point from the processes we know, it should be a fairly simple matter to decipher the messages they have left behind."

● Savary returned to examine with her the various writings carved along the bases of the larger pillars. In their search for more, they came upon a majestic arched door set at the farthest end of the vast hall, on whose great double panels some time-enduring inscription had been carved in letters at least a foot in height. Nadja made a careful copy of them, but their subsequent efforts to open the massive portals were vain. After expending some fruitless energy, Savary resorted to his disintegrator ray, but with equal unsuccess. Fire flashed in guttering sparks from the smooth, green surface, but . . . save for a slightly pitted appearance in the surface of the metal . . . the door remained intact. The Terrestrial switched off the ray and surveyed the mighty portals frowningly.

"If this is metal, it must have been rendered malleable in some manner or other," he said. "I would be curious to see what effects a substance that even a ray that disintegrates all known molecular substances, does not affect. It is strange that with a mineral composition so different from that of Earth, this small world should have apparently produced beings so closely resembling us. One wonders if the human form is the one most fitted to survive in any evolutionary struggle . . . but that could hardly be! Nature is not as restricted and monotonous as all that. Chemical combinations kindred to those on Earth must have existed here in conjunction with a totally different mineral, atomic principle. That is the only explanation. However, the problem before us now is the opening of this door."

"We might try the heat-ray," the girl said. She turned hers on. The surface of the door glowed with an almost unendurable brilliance, but remained intact.

Savary spoke. "Turn it on the spot where the disintegrator ray touched it." She obeyed. This time the metal glowed red instead of golden. When she switched it off, a perceptible indentation of the surface was apparent. Savary played his disintegrator over a wider area, bidding Nadja sweep the heat-ray in its wake.

The metal glowed reluctantly; gashes of molten light appeared and deepened and spread. After a half hour's work, a wide cut appeared, spreading from the top to the bottom of one portal, and a few minutes' work on the hinges allowed the whole side panel to fall away with a resounding and oddly musical clang into the unseen passage beyond.

Before them, a broad and inky hallway stretched in a steep downward slope. As their feet scuffed the immense blocks of stone that paved it, Nadja cried out in admiration. Where the blackened deposits of time had been rubbed away, it showed the color of copper allied with a semi-translucency comparable only to the moonstone or opal. Within its depths, odd glows and reflections seemed to wake from their age-long sleep under the brightness of the head-lamps. Savary bent to examine it, then shrugged.

"There was evidently no more of this left when the sun created our world and that of Mars. The ivory stone of Mars is lovely, but this is infinitely beyond it. It may have been the equivalent of gold on this asteroid. Here, as on Earth, they may have paved their most hidden sacred places with their most precious metal."

They were descending ever deeper into the planetoid's cold heart. Endlessly, the brilliance of their lamps walked before them through a world whose pulse had ceased to beat planetary ages before Earth had spawned Man. Slowly . . . as they walked ever on and downward . . . Nadja Manners felt the weight of the lethean darkness, the appalling emptiness of this forgotten shell of the past, seep through her mind like a drug. The air within their helmets grew foul and they halted to release another cylinder of concentrated oxygen. Still they walked!

Suddenly, Savary dimmed the light of his head-lamp. Ahead of them, a radiance, faint and fluorescent and unreal, played against the walls and floor about them. The portals of another door . . . a door of the same beautiful substance as the broad-flagged floor . . . reared before them, but some agency, earthquake or cosmic tremor, had reft the panels apart, and through the aperture, a faint, pale radiance glowed and played . . . had glowed and played for cosmic aeons!

Nadja Manners withdrew an arm from the constriction of her space-suit and fumbled for the stimulant tablets that she had placed in her pocket. The strangeness of that faint light, glowing in a long-dead world, the burden of the endless walk through the airless heart of a once-living planet, added to the strain left by her battle with the nameless, icy *thing* of the day before, and the tortured hours of weeks of hiding aboard the space-ship with no other occupation than the acid corrosion of her own thoughts, had sapped her strength. For a moment, she felt as though she would belie her promise to Savary and reveal the greater weakness of her woman's frame and nerves.

The quick lash of the stimulant, however, stung her senses back into a renewed vigor. Collecting herself, she moved on and passed through the broken portals into a vast room fashioned like a smoothly rounded inverted dome whose walls and ceiling glowed and pulsed with soft waves of an eerie silver radiance through which vague restless eddies of shadowy crimson seemed to flow. What light was it that could glow here without air, that could gleam and flush and fluctuate with a living brightness, after the passage of uncountable years? The two Terrestrials could only wonder vainly as they paused and stared. What they saw swept it from their minds.

A Voice from the Past

● Against the glowing walls, great niches of bronze opal-stone, each holding a wizened mummied shape, showed that this room was no more than an immense tomb. Preserved by the airlessness of their world through the immense sequence of the passing years, they leaned back with folded hands and closed eyelids as though they merely slept. Small old men of fairy-like proportions, beardless, wrinkled and dried up, frozen rigid by the unnamable cold of space, each richly clad in garments

of some corroded metallic tissue, were waiting . . . like Barbarossa's knights . . . the trumpet of some cosmic resurrection.

In the hands of one, who seemed to be presiding over the others, a copper-colored scroll rested untouched by time. Gently, Savary disengaged it and placed it in the pocket of his space-suit. He examined the ancient mummied figures. They were of a markedly human type; small . . . the tallest may have been five feet in life . . . and of a light-boned build of an oddly bird-like quality. The faces seemed to have been small-nosed and rather strong of brow and lips, and their hands possessed two thumbs and must have been of a remarkable dexterity in life. Nadja spoke slowly.

"They may well have been of an intelligence superior to ours. Man is supposed to have won over other animals in the evolutionary race because he possessed a thumb. I wonder what effect the possession of two of them may have had on the mental development of this race."

"That roll of bronze metal paper may tell us . . . if we can decipher it," Savary answered slowly. "There is no outlet to this room, and I think we have seen enough for today. Whatever this dead asteroid has to say lies here and within that roll. Let us get back to the ship and try to read it."

Turning reluctantly, they went from the glowing tomb. As they retraced their steps through the long, sloping tunnel, Nadja queried.

"What could that light originate from? It must have glowed there for endless centuries."

"Probably the effulgence caused by some slow disintegration of matter . . . a matter unknown to us on Earth, and whose laws of disintegration are different from ours," Savary said. "The sun was a richer laboratory when these asteroids were flung forth than she was when she created us. The rate of the disintegration of matter is so slow . . . habitually . . . as to make it, from a human point of view, almost unending."

The blaze of distant stars in the black of space emerged at last from the tunnel-darkness like a welcome sight.

They regained the space-ship without hesitation. Savary decreed that food and sleep must precede the tackling of the hieroglyphs on the records they had gathered. He showed little doubt of their being able to do so. If the minds of the long-dead dwellers of the tiny world whereon they had landed were not wholly different from their own, it would only be a question of time before the secret of their writings lay bared to Savary's skilled eyes.

The first day's work showed him that Nadja Manners was practically as efficient as himself in the art of deciphering, or rather tracking down the roots of the writing of the dead people. Through some strange alchemy of necessity, the man and woman, so definitely stranded in the immensities of space, had swung into an impersonal, harmonious enough, collaboration. Confronted with the inevitable, Savary had accepted it with a shrug. If a woman was to be his companion for as long as the life of one or other of them defied the varied menaces of the void, he would use her as the helper he needed. Her humanity was an undeniable solace whose value he estimated more in terms of mental and moral effectiveness than in those of emotions, but her value was weighed according to her efficiency and with a complete indifference to her personality.

Like an automaton self-fitted to the needs of his mind, Nadja Manners was content to be what he chose to have her. The passionate atonement that had driven her out into the void to share his fate, whatever it might be, had drained all thought of self from her. As contained and quiet as a frozen woman, she stood ready to be just what he needed most; a helper, an impersonal companion, a disciple in whom he could trust.

Now, on realizing that she was fully as capable as himself where the art of ideograph reading was concerned, Savary promptly left this lesser matter in her hands while he began a series of preparations within his laboratory, whose com-

plexities were almost beyond a layman's comprehension.

● Delving continually into the store of raw materials he had had placed on board the space-ship, he spent sleepless hours within his workshop or laboratory. On the third of the little planets, brief days after their return from the dead city, Nadja called him forth and said:

"I think I have the sound effects of their alphabet. The ideographs were, of course, much easier. If we both work at the translation of the documents we should be able to read them by tomorrow."

Within twenty-four hours, the translations of the impressions taken from the sculptured pillars and of the writings within the copper roll lay before them. The ideographs and writing on the pillars of the first hall proved to be formal eulogies of a one-time live world. On one, the inscription read:

"Lo! (or an equivalent) This is Speira . . . the lucky child of the sun. Give thanks ye who have been born on her happy sphere."

On the other (Nadja had brought back impressions of only two), they read:

"Of the five sister planets, Speira is the favored. Our scientists have looked at Marinoe, which lies outward, and saw there nothing but waters or vapors of waters. They have looked at Sakka and Lydda . . . sister planets circling each other as though strung on one slender rod . . . and find but arid, airless wastes. They have looked at Reinos the Luminous, which follows our orbit, but always a little in our rear, and saw but a glowing chaos of unresolved gases. We only have all blessings for which give gratitude."

The frequent sun had once more set behind its bleak, dark hills. Wrapped in star-beaconed blackness, Speira was turning through the cosmic night. Savary set the first two documents aside and went through the stelumin-walled passages to the glassite-enclosed observatory. Slipping back the shutters of metal that covered its roof, he swung the powerful telescope outward, towards the blazing skies. After a few minutes, he arose and bent over the stellar charts spread out on a nearby table. "'Marinoe, which lies outward,'" he quoted, as he made a mark. "What are a few million years to the orbit of a world?"

Swinging the telescope once more so that it ranged the heavens slowly, he finally located Reinos and marked its position likewise on the chart. A futile search convinced him that Sakka and Lydda were either below the horizon at the moment or else had vanished in some spacial catastrophe in the past. He would look for them at another time. Meanwhile, there was still the copper roll to read. It had been impossible to gather more than tantalizing scraps of its purport while he translated it. Spreading the pages before him, when he was once more back in the warmth and light of the control room, he began to read in a low, steady voice. The rough interpreting showed many gaps and hesitations, but the tale of a planet's end overcame, with its drama and vigor, all defects of interpretation. The document read:

"We of Speira . . . once called the lucky planet and now facing the ultimate doom that awaits all worlds . . . do here record the final testament and story of our race in the slight hope that it may some day be found, perhaps by creatures akin to us from our sister planets, perhaps by those for whom it is principally written.

"In the season 27 of the 7000th cycle, our scientists first noticed the increasing thinness of our atmosphere and gave warning of our doom. Though we searched frantically for two generations for a means of averting fate, in the 147th season of the 7000th cycle, we realized that our doom had been set on us by the cosmic gods, and that . . . with two-thirds of her people already dead from the ills brought upon us by the terrible rarefaction of our atmosphere . . . Speira was facing her death-throes. Then it was . . . shortly after we knew that our end had come . . . that the unhappy remnants

of our once-favored race began to fall victims to the shadowy unseen terrors, come, we believe, from bleak Sakka, whose very touch can freeze the life from any creature of flesh and blood. With the thinning air they came. Ever more numerous and horror-compelling: *things* that the eye saw only as a reflection, that no weapons seemed to touch. Therefore, those of us who remain . . . pitiful and small is our number . . . have fled to the depths of our world, burrowing like the mole where the air still clings closest and densest, in the ancient temple-halls our forebears built for their gods. Here we will die. With us will perish the favored race that Speira loved and fostered. With the vigor still in our veins, with our racial course still barely started towards that goal at which life is aimed . . . that goal, distant, infinite and barely perceived at which organic existence has been launched, but which the laws of the cosmos seem to bar from ever reaching . . . with the promise within us no more than the bud of our race's blossom, we must perish and nothing will remain of us save ruins set in frozen wastes.

"Yet we are not yet dead, and before we die, we will venture one more defiance at the bitter cosmic fate which overwhelms us. Perchance in some distant future there shall come beings to this air-stripped world, conquerors of the, as yet, unconquered void. Perhaps nature . . . in that dim day . . . may turn and reverse her edict and give to Speira once more, the beneficient atmosphere that nurtures life! For that slight chance we shall prepare, in the frail hope that our race may not wholly, and forever, perish. O ye who may never find this . . . for well we know how mad is our dream, how mad our defiance of fate . . . look on those who watch over this writing and know that they are dead. But when you come to the sleeping place of Youth, to the tomb of Speira's hope, know that what you see is not death but the unchanging, ageless cataleptic state over which the centuries may roll and airless aeons pass without taking toll. If Speira can once again support organic life, wake them and let our one last hope come true across the infinite reaches of time. Let our lordly race live once more upon the soil that bred it! Join hands with us who are no more than dreams of a dead day, with us who have sought to hurl with our puny hands an ultimate defiance at Time! Help us, O stranger, once more to breathe and be! Meanwhile we die! We who have seen the set of Speira's day . . . her cosmic span. We die! But beneath us, unsentient and at peace, Speira still lives! Salute!"

Savary laid down the translated pages in a tense silence. Across thousands of years their message had come . . . direct as a straight-flying arrow . . . to the hand for which they had been prepared. Time dwindled and grew ineffective under the thought of the vast and conquered vista thus spanned by organic minds. As his imagination swiftly amplified the brief picture painted in those ancient words, weaving this and that thread into a more complete whole, he felt the virility of his blood . . . the daring that lay within his own mind . . . give instant homage to the arrogant challenge, those dead ancients sleeping in the buried room they had found, had flung at Death and Time and Space. Truly, they had died too soon, these people whose evolutionary future held such nascent powers.

Walking to the glassite-roofed observatory, he looked out once more at the enigmatic, wheeling heavens, at the blaze of unchanging stars. The barren reaches of the Speiran plateau on which his ship reposed lay like a sinister foot-note to the tale he had just read. Swinging on Nadja Manners, who had followed him silently, he said in a low, tense voice:

"It must . . . it shall be done. Speira shall live again!"

CHAPTER V

Invisible Horrors

● The moment had come when the girl who was his fellow exile must be allowed to share the knowledge of the gigantic plan Savary had harbored and per-

fected in the weeks of his rush through space. Back in the control room once more, he gave her, in incisive sentences, the explanation of the startling words he had just uttered. Leaning back against the cushions of one of the broad, low seats, he marshalled the array of facts and incidents which lay back of them. Breathless, the girl from Earth listened to the tale of the approaching doom of their far-distant world . . . a doom which only this man by her side had foreseen and striven to find the means of turning aside.

Savary told of his first suspicions that all was not well within the earth's atmosphere; of tests which convinced him that the altitude of the navigable stratosphere had appreciably lowered during the previous few years and that the rarefaction of the air of the highest mountain summits had increased alarmingly since the preceding generation. Working mainly by hypothesis, he had scanned the accepted theories of the deaths of planets through cold, the thermal death which some scientists held to be the final doom awaiting even the cosmos itself, and had found that, as far as explorative data which he gathered on the moon as well as on the satellites of Mars gave proof, the death of these miniature worlds appeared to have predated their thermal death by thousands, perhaps millions of years.

Pushing his studies still further, in ways that were possible only to the richest man and the most brilliant scientist on Earth, he reached the conclusion that the real cause of all planetary death was the suddenly hastened leakage of its atmosphere into the surrounding void. That the fingers of this doom were already brushing the unsuspecting Earth, he could hardly doubt. A vast accumulation of carefully gathered data lay under his hands to prove that the precious air of their globe was thinning and vanishing into the hungry maw of Space. That the rate of this leakage was being speeded up with every decade seemed also apparent. Sardonically, he remarked that it was his realization of how slow and tedious any steps to save Earth . . . if such a thing were possible . . . would be, that had served as one more spur towards the Titanic bid for absolute monarchy of their world which had failed. Drawing a lump of mineral matter from his pocket, he rolled it over to her.

"That lump of metal helped to give me the key to the vast sickness of which the earth is already dying," he said, "but I will come to that later on. First, I must tell you that the loss of our atmosphere into space is not, accurately, a leakage or actual disappearance. It is simply a slow spreading of the atmospheric envelope about a nucleus that has lost the power to hold it at its proper density. Growing more and more tenuous as it spreads out into the void, it soon becomes almost too thin for detection by any habitual method . . . far too thin for the prolongation, in any case, of life as we know it. Ultimately, it may become so thin as to be completely absorbed by space; but I doubt it, for the mass of the globe it belongs to must continue to hold and bind it vaguely to its central focus in some manner or other while the laws of the attraction of matter for matter remain. I am convinced that there is still air upon the moon . . . though I had not the time to prove it . . . also that airless planets are no more than worlds whose atmosphere has spread away from them till a near vacuum . . . but only a near vacuum . . . exists upon their surface. I am convinced that there is still air upon this little asteroid, and I intend to prove it by reversing the course of events that bled her atmosphere away from her and by drawing her envelope of air back around her once more."

"Which means that you know the reasons for this planetary death?" the girl scientist cried as he paused. Savary nodded.

"I think I do. Loss of vitality of a world's magnetic field can be roughly given as its explanation. Gravity and magnetism are, we now know, twin prongs of the same force . . . complementary laws. But it is only lately that I have discovered that the former can exist after the latter power

is destroyed. It is the loss of its magnetic forces that causes a planet slowly to lose its hold on its atmospheric envelope. This slowly drifts away from the nucleus that held it till it is finally no more than an infinitely tenuous veil spread over the surrounding void; a veil not wholly disassociated from the gravitational attraction of its world, but practically useless and indistinguishable; at least by our actual apparatus. What causes this failure of magnetic attraction? A loss, as I have said, so definitely distinct from the simpler attraction of matter, that even on long-dead planets like the moon and this little world, men may walk under the influence of gravity although the magnetic field of the planet has been drained almost dry, was harder to trace. I am still not positive as to certain formulae concerning the stimulus the radiation of matter gathers under the influence of cosmic ray bombardment. I am convinced, however, that at a certain point in the evolution of a world, this radiation is stimulated or sped up to a constantly increasing rate. Science has given an infinite slowness to its conception of the radiation of matter. They have erred as to the uniformity of its progression. That small lump of metal, highly magnetized and placed on the barren soil of the moon, unprotected from the direct influence of the cosmic rays, lost its magnetic properties one thousand and four hundred times as fast as another piece set on the roof of my laboratory on Earth, and three thousand times as fast as a piece of the same size was supposed to lose its magnetic powers in the equations made by scientists a hundred years ago. This and other computations prove to me that through some cosmic law of destruction, our planet is losing its atmosphere at a rate that progresses by a mathematical equation of consistently increasing speed which it is useless to enumerate here. As the atmosphere thins, the radiations that are bleeding our planet increase at amazing ratios. Inside our generation, the effects of this situation will begin to be felt . . . by scientists at least. Within another two or three generations, Earth will be close to her doom."

● Nadja sprang to her feet and looked at him with haunted eyes. "And even if your experiment here proves successful, there is nothing we can do to save her! Nothing! When they thrust you forth into the void, they flung away the one man who could save Earth! If Earth perishes . . . turns into a bleak, spacial skeleton like Speira," she shuddered as she cast a glance at the panorama framed by the vision-plate, "It will be my fault! My fault alone!"

Savary lifted ironical eyebrows. Then his face suddenly grew grave. He spoke with unwonted emotion.

"No. If Earth dies, I alone must bear the blame. I could have spoken before I left. I did not. Since I have come here, I have had time to regret it. In any case, your concern assumes that the . . . experiment . . . I am going to attempt on this planetoid will be a success; an uncertain hypothesis. If it is, however . . . if I should return life to a defunct world . . . it should not be impossible, perhaps, for me to solve the simpler problem of communicating with Earth across even the barrier of interplanetary space. And other scientists there may reach the same solution in time as I have."

"How could we cross such an abyss . . . since the *Victory* can never reach Earth?" Nadja asked despairingly. "Even the small mass of the first asteroid you approached repulsed us."

"If we return air to Speira, it must be done. We might signal . . . or build a space-ship that can approach Earth. Whatever happens meanwhile, we must remember to plan what shall be done in the eventuality of the destruction of one of us. For the moment . . . while it is still night . . . let us try to sleep. Tomorrow the real work will start."

For a month they immersed themselves in toil; toil unremitting and protracted which only the weightlessness of their tiny world rendered possible. Savary learned to appreciate Nadja Manners as he would another man. He found her a tireless, uncomplaining assistant, almost a part of himself like an extra arm or hand, so quick

and trained was her every response to his demands. In the intensity of the Homeric work they had undertaken, he forgot to think of her as a woman. Instead, he began to give her the respect he would have given a masculine scientist of her intelligence and capacities.

For a month, they met no signs of such icy beings as the ancient Speirans mentioned, the ghostly presence that had almost slain Nadja. The spectacles Savary had made in expectation of their coming remained always ready within the helmets of their space-suits. In the silence of the dead world, they toiled; two puny beings doing the work of fifty, thanks to the vast scientific resources of the *Victory*, and to the genius of the man Earth had exiled.

Exploring the asteroid in his rocket-boat, Savary had finally located one of the ancient mines from which had come, aeons before, the strange, green metal that the Speirans had used. By combining a heat-ray with an inner pencil of the disintegrator-beam . . . the first forming a sort of tubing of flame around the more deadly ray . . . he found a method that allowed them to mine and shape the practically indestructible metal. From it, green girders and braces, slender, heat-welded beams and broad bases, were finally shaped and transported by the aid of rocket boats to the site of the first of Savary's "revitalizers." This was on the plateau of the *Victory's* landing place. Here the great heat-beams and disintegrators of the space-ship could be used to groove and prepare the ground as well as to give a final welding to each piece as it was put into place. From the store rooms of the ship, ingots of stelumin and of the old-fashioned but still useful compressed steel, were pressed into service till at last the strange creation took on body and form. Lying like a shallow basin, face upward to the star lit sky, a great bowl of brilliantly polished stelumin formed a reflector of such strength that the sun itself seemed to be pouring in and out of it at noonday. On higher girders on either side, smaller mirrors whirled and spun under the driving power of stored solar energy drawn from one of the smaller replacement engines with which the *Victory* had been abundantly equipped. Hourly these blazed high above the ship and the stabbing black peaks, throbbing with the might of heat and light that they caught and imprisoned. Though Speira was farther from the sun than the earth, its absence of protecting and blanketing atmosphere compensated easily for the added distance. The very effulgence of the ardors which poured themselves unhindered on the scorched and airless soil seemed to fire to a vibrating life every mirror and girder of the vast machine lifting out of the moribund world. The small solar machine vibrated with the energies pouring through it, and every section of the whole vast creation of metal seemed to be feeding on sun.

It had a strange enough appearance, this machine that should revitalize a world. From the vast concave central mirror, a thin web of steel and stelumin radiated like a vast spider's net. Each strand of this metal web plunged at varying intervals beneath the ground. Beneath the central bowl itself, a woven mass of cables thrust down to the very bowels of the asteroid. Looking at it completed, Nadja wondered how such a creation of complex metal could have emerged from the hands of two such human pigmies as themselves. Only the leashed powers and knowledge at Savary's command had indeed made it possible. During its erection, there had seemed no end to the fertility and resources of his mind, nor yet to the steel-like vigor of his mighty frame. More and more, her own once-arrogant mind had abased itself before an intellect whose limits seemed endless, but at the same time she had felt her own mental powers expanding and steadily mounting under the stimulus of Savary's direction.

As she stood considering the vast web of mirrors and steel, Knute Savary was examining with an unrelenting minuteness, each cranny and corner of his immense mental child. In his grotesque space-suit, he looked like some giant spider crawling over the web it had just spun. Above them, the shrunken sun poured it-

self furiously into the revolving mirrors that blazed in the desolate scenery like miniature orbs. Stars hung like frozen flares in the coal-black sky. The two tiny satellites of the dead asteroid seemed slivers of silver flung against the nearer night. Suddenly, Savary leaped down from the machine and his hand touched a lever set at its base. From the heart of the great mirror a new light flashed . . . a light that had never glowed for human eyes before. From the junction of the manifold cylinders . . . whose use had puzzled Nadja . . . at the mirror's very center, a pale gleam of ethereal blue shot forward and out into space. No more than a pencil's width, it rose and reached out and out, an unreal line of barely perceptible light speeding towards the sun. Suddenly, it seemed to vanish into the remoter night.

Nadja heard a shout of triumph beat against the receiver of her radio set. Knute Savary swung on her.

"I was right! There is still air on Speira!" he exclaimed, "air too dilute for our instruments to record, but the proof I needed that there is no leakage, only dilation of the atmosphere, in the death of worlds. If there had been no trace of air here, the neutron-beam would have been invisible. In properly dense atmosphere it would have crackled and sparkled. It has detected air where all our instruments have failed."

Nadja Manners caught her breath. A neutron-stream!—the dream of all the scientists of Earth!—a dream not yet realized, but which Savary's genius had nonchalantly transmuted into fact. Her scientific mind leaped swiftly across the vistas of unlimited power it opened to her. She exclaimed:

"A neutron-stream! To tap the reservoirs of the sun itself?"

"I have already tapped them," Savary returned drily. "When I gave solar energy to the world fifteen years ago, I harnessed the sun to the service of the world, but all that we could obtain was a diffused and unselective force . . . three-quarters of its potentialities were lost or squandered. Much of it could not penetrate our layers of air. Now, however, this neutron-beam should tap the greatest source of energy within our system as directly as a wire taps the juice of an electric plant, and should conduct its terrific forces straight to the reservoirs prepared for it . . . the metallic core of this dead world. It is a wire I have flung into space, along which the electrical . . . to give them a simplified name . . . potentialities of the sun can pour into the inert veins of this dead sphere of matter. The narrowness of the beam will prevent an overpowering charge from disrupting the very planetoid itself, as well might happen. But now I will switch it off. Before it can be really used, we must construct three others like it in a belt around Speira, so that, as the asteroid rotates on its axis, it will be continually charging itself from the reservoirs of the sun. The other ones being standardized, however, will take less time to erect."

"Are the mirrors themselves part of the neutron-stream creator?" the girl asked.

"No. They are receptacles for solar energy in a less selective form with which I hope to regulate the terrific power that is going to be hurled across that slender beam. The smaller, upper mirrors are simply switches which turn off the neutron-beam by light pressure or vibrations when the charge coming across becomes too heavy. But . . ."

He broke off sharply. Against her head, Nadja felt a touch of intense ultra-cosmic cold. The sun-filled blackness seemed suddenly to be swirling before her eyes. Savary's heat-gun crackled sharply across the spacial dark. The numbing cold withdrew . . . for a moment only . . . but in that moment she had understood, and with fumbling fingers, slipped the spectacles Savary had made over her eyes. Then she screamed!

The sky above them was full of strange and ghastly floating shapes. It was . . . her reeling mind registered . . . like looking into some unknown and nauseous dimension. As Savary had foretold, only the immediate nucleus of the airless beings were visible, the outer edges escaping com-

pletely the range of the strange, prismatic crystal. How vast they were it was therefore impossible to say. Their loathsomeness was, however, definite beyond description. Formless livid *things*, they pulsed with a light that had no counterpart on Earth: a livid light, filled with colors that the human mind had no knowledge of. Like giant jellyfish of the skies, they moved and rippled and glowed above the two humans, sinking downward in pulse-like movements, too numerous to count.

Plans of Destruction

● Evidently, something within them told them that Savary was the more dangerous foe. While she herself was left free for a moment from attack, Nadja beheld innumerable folds . . . whether of one or many it was impossible to know . . . settle down and swathe around him as though by a concerted plan. The heat-gun flamed out, dissolving the vague ripples at his feet, but the girl realized in one horrified flash that they had managed to imprison his arms beneath their icy, impalpable touch. The heat-gun spat once more, but only to scar the ground at his feet. With a choked exclamation, she hurled herself forward, feeling at the same time a frozen touch seep through the space-suit's thickness at the back of her neck. Indifferently, she let it slip down her back in numbing waves while her heat-gun flamed in great arcs that swept over the things that swathed themselves shimmeringly around Savary. Like dissolving vapor, they melted and were gone. The man swung towards her with a numbed slowness. She sank to her knees. Already the icy cold was mounting to her brain, for no human circulatory system could endure for long that unearthly touch. Suddenly, warmth flowed back into her veins! Knute Savary stood over her, sweeping the oddly shimmering waves of the loathsome foe with both his guns. His voice beat in on her imperiously, urgently: "Quick! Get a vita tablet into your mouth somehow! I can hold them off for a second, but you must guard my back while we retreat to the ship."

Slipping an arm out of the inner folds of her space-suit, she managed to get one of the small, almost magic restorative tablets into her mouth. Its effects were instantaneous . . . and stimulated her only just in time. Above her, a great translucent shape was pulsing down towards Savary's unprotected back. Her ray caught it as it swooped. Then, for uncountable minutes, there was nothing but this strange, nightmarish struggle against these unimaginable foes. Back-to-back, they slowly retreated towards the *Victory*, while about them, indescribable eddies and tides of spectral lights shimmered in horrible waves. Color tones far below the range of human vision seeped in through the strange prism of the dull rose crystal across their eyes; icy touches from some non-organic world reached out at them and retreated from their crackling guns.

The creatures might have been one or a million. There was no means of knowing, since their edges, if they had any, melted out beyond the range of even their broadened vision. Savary had the impression that they were coming in superimposed layers out of the airless sky. Only by weaving a constant network of fire around and above themselves did they manage to stave off their onslaughts of icy death. Even so, time and again the arm of one or another dropped under some numbing touch; once Savary's head seemed to petrify beneath a breath of that ultra-cosmic cold; only the sixth sense which made Nadja sweep her heat-gun upwards, above both their heads, at imminent risk of scorching through Savary's space-helmet, released him before his brain had ceased to function.

Like two people struggling within the bonds of some awful dream, they had lost all consciousness of time. Suddenly they found themselves stumbling backwards against something hard and smooth . . . the stelumin side of the *Victory*. As though they had sensed that their prey was escaping them, the fluctuating, fluorescent *things* pulsed down in a grimmer attack. Though the heat-ray returned them to a kind of original vapor, a thin drift that the thirsty

void absorbed as sand drinks water, the fear of destruction was either outside their comprehension or else they could rise superior to it. The sickly light beat down with a swifter and swifter rhythm; the translucent folds dropped their icy swathings more and more rapidly around them; their own fiercely driven muscles began to fail. Reeling, Nadja Manners felt that the whole world had changed to one swirling eddy of pulsating horror. Even under the lash of her will, her fingers were faltering, fumbling on the gun trigger, growing slower and slower in their efforts at unceasing motion. Icy tentacles fastened once more on the back of her neck. This . . . her dimming mind thought . . . was the end!

Then the icy touch melted away as so many others of them had done. Savary's ray hissed past her head. The door of the space-ship was behind her and a strong arm lifted her and flung her bodily into the blessed darkness within. Blocking the narrow entrance with the width of his powerful shoulders, Savary played his devastating ray over the writhing, gleaming, transparent hoard without. Nadja stumbled to her feet and he barked in an unrecognizable, gasping voice: "Quick! Turn the ship's rays on them!"

With a last spurt of energy, Nadja dragged herself to the nearest control-panel . . . the space-ship's weapons being arranged so as to turn on from the outer airless locks as well as the inner control-room . . . and jerked the main lever down. Instantly, the whole vessel flamed with a spitting, green-hued wave of death. Behind her, she heard the small door clanging shut. There was a cessation of the horrible, reflected glow from without. In her last moment of consciousness, she saw Savary take a few stumbling steps towards her and collapse at her side.

* * *

The distant sun had slipped below the jagged horizon of their planetoid world. In the warmly lighted central room of the space-ship, Nadja and Savary lay at ease on the cushioned seats. The vision-plate in the center of the control board showed a starlit vault of sky, and brooding rocky peaks unsullied by any shadowy horrors. When Savary had regained his senses and stumbled to the levers of the great heat-rays, there had been no sign of their foe left. Either they had all returned to their primitive vapor under the terrible bombardment of flame hurled at them, or the survivors had fled. Now, after warm baths, a stimulating rubdown with the newest tonic-oil of Earth, and a good meal, the two Terrestrials felt their physical vitality somewhat restored. The languid serenity that comes after combat hovered over them. For the first time since they had found themselves comrades in their spacial exile, a silent bond of peace united them. Savary smoked lazily and Nadja lay outstretched against the cushions whose softness had been designed to absorb the shocks of the ship's departure from Earth, watching the virile power of her companion's face between half-closed languid lids. A new, a pleasant peace had settled in the heart of the space-ship, with dangers shared and horrors overcome.

After awhile, Nadja stirred from her contemplation and said absently: "I suppose the light they shed is below or above those waves visible to the human eye?"

Savary nodded.

"Below, I think. Our own light-waves break or curve against their bodies. Our prismatic crystal evidently possesses the capacity to seize light-waves beyond those our eye can perceive, apart from the power it has of straightening bent rays. Those colors with which they pulsated are located far below the infra-red. Their molecular vibrations are unlike ours, too. They are, I believe, as nearly beings of another dimension as it may be possible for us to perceive. Probably they are beings of another dimension who have slipped slightly over the border-line which may divide our world and theirs. Links, as it were, between There and Here. That cold which they generate is beyond all conceptions we have of the ultimate zero. Of course, that in itself means nothing.

What Man believes he knows of space is hardly more than theoretical speculation. It is an undredged ocean which we try to chart by the sea-weeds cast upon its shores. Nevertheless, I am pretty sure that those creatures have no existence for any of our sensatory nerves. It is only through our psychic senses that we realize them. They are on a dimensional border line we have never as yet visioned. That is probably why there is a sense of unnatural horror about them."

Nadja shivered.

"If they were wholly of another dimension, they could undoubtedly leak through the walls of the *Victory*, if they chose."

"Probably. But if our conception of matter did not exist for them, by a concomitant factor, they would have no power to harm us either. It is their border-line state that makes them deadly." He paused and knocked out the ash from his pipe with care. "Too deadly to be allowed to survive," he added slowly.

Nadja turned on her cushions.

"What can we do against them?"

"If that ancient manuscript is right, they are a product of Sakka. I hardly see how we are going to continue our work here with the menace of these *things* hanging continually over us. It was only by a hair-breadth's chance that we survived today. If we are to continue our existence here, we had better declare war ourselves. Follow them to their planetoid, that is, and exterminate them, if it be possible. At least, we know that our heat-rays are deadly to them."

He looked across at the woman opposite him. She turned pale and shuddered, but her voice remained steady.

"Why not?" she said, "if you think it possible."

Savary's eyes kindled. He smiled in sudden approbation. Leaning forward, he said: "I take back my indictments of your sex, Nadja Manners. Some women are the equals of men."

A slight flush mantled the girl's brow. Without answering, she drew one of the stellar charts she had recently completed towards her. With one finger, she measured the distance between Speira and Sakka as she had charted it.

"A few hours' flight," she said. "Less, if we did not have to start decelerating almost as soon as we leave."

"We can rest for a couple of days . . . . . there are some preparations to make . . . . and then start. Within the *Victory* we shall have no dangers to encounter, I think."

Nadja rose yawning. For a minute, she stood beside him looking down at the distant point of light that was Earth, swinging up from the horizon of the vision-plate. That trembling spear of light was . . . . beyond all hazards of the present and the future . . . . their final, ultimate goal: its salvation something which they must yet achieve. Both saw the path before them with lucid eyes—a path of cosmic achievement! First, the destruction of the invisible *things;* then the revitalizing of Speira, the finding and waking of her sleeping youth; lastly, by some means or other, the saving of the distant, unsuspecting Earth. Looking at Savary, Nadja believed that all this would be possible to him; though it would have been impossible to any other man. Unless death should trip them up in remorseless space, Savary would achieve it. As for herself . . . . her downcast eyelashes veiled the immolation of all within her that she offered him. If, despite herself, she remained a woman . . . . even in these bleak ways of the sky . . . . a woman in love with the man within the scientist before her, she had learned to hide it well. Half-oddly, she recalled the ancient mythologies, almost forgotten on Earth, with their legends eternally proving that there is no happiness in life for she who loves an Olympian. She looked up again at Knute Savary. He was standing over the stellar chart, one finger marking the small dot she had drawn on its surface for Sakka. There was a steel-like flash in the depths of his eyes. "In three days," he said, "we shall leave for Sakka."

CHAPTER VI

The End of the "Things"

Once more Savary consulted his charts, then swung down a lever. The braking rockets flung their silent flame across the void. Slowly, like a glowing yellow moon, Sakka rose into the frame of the vision-plate. Leaving the controls to Nadja, Savary made one last tour of inspection around the space-ship. Everything was in readiness. In their cradles, the rocket-boats (newly equipped with powerful, though small heat-rays) lay ready for an emergency launching. The smooth walls of stelumin of the inner decks had all their outlets closed against the possible rupture of one or another of the outer shells that ran in three layers around the core of the ship. The great heat-ray guns waited. Above them, the smaller but deadlier disintegrators just ridged the faceted walls of the gleaming hull, while within the bow cabin of the space-ship, small dull oblongs of metal lay ready to launch, bombs filled with radiumin liquid, a discovery of Knute Savary's which he had withheld from the world because of its deadliness and endless powers of destruction.

As he paused in the observatory and turned the telescope towards the growing disc of Sakka, the luminous edge of its sister planetoid, Lydda, swam into view. Neither asteroid was as large as Speira; probably no more than one-quarter the size of the moon; and as they sped through space in the asteroid orbit, they seemed to revolve about each other as though they were the two spherical extremities of a whirling dumbbell. Savary studied a minute the curious problem this divergence from the usual behavior of solar tributaries presented to the astronomical mind, then left it for a more favorable opportunity. Already, as the *Victory* devoured the spacial leagues, the tiny sphere of Sakka had swollen and grown till it filled the immediate sky. Nadja had turned on the full power of the braking rockets. Soon they were sinking down like a floating feather towards a world like some nightmare of space.

Beneath them a strange, liquefied surface glowed with a pale, livid yellow light and seemed to shift and quiver like agitated oil. As they sank closer, Nadja noticed that here and there in the vast surface of semi-fluid matter, a blunt white pinnacle seemed to obtrude like a piece of unhealthy bone upthrusting out of the planetoid's viscous flesh. Taking a reading of the atmosphere and pressure gauges, they found that this tiny world was not, like Speira, wholly stripped of perceptible atmosphere. The gases indicated were, however, unfamiliar to both of them. Only one, nitrogen, was known upon the Earth. Savary lifted his eyebrows at the reading and abandoned the control-board once more to Nadja. Removing one of the test-tubes from the atmospheric reader, he brought it into his laboratory and made a few rapid tests. In the dark, the thin gases glowed with a faint pulsing light. When he returned, Nadja was skimming as low as possible over the surface of the strange repugnant world. The instability of the sluggish element beneath them was now revealed as a constant sucking and eddying unrest within some liquefied matter too heavy for ripples, but nevertheless constantly agitated by a giant pulse-like beat within it. Savary spoke.

"Pretty place, isn't it? The atmosphere is radio-active, with a slight density and a near-zero temperature. There are a few traces of familiar Terrestrial gases, but only as a dilution for some heavier gaseous substance completely foreign to our knowledge, as might be expected. Its radio-activity, however, is quite perceptible. I have always wondered whether radio-activity might not be the gateway, or one of the gateways, to another dimension. In any case, it is probably the mainstay of these creatures' existence."

As he spoke, he drew out his rose-crystal spectacles and slipped them on. Nadja followed his example, and as they bent once more over the vision-plate, an exclamation rose to their lips.

Beneath them, what had been no more

than a sea of viscous fluid, suddenly transformed itself into a nightmare vision of pulsing, league-deep layers and semi-transparent *things*. It was impossible to see where one began and another ended. The whole planetoid was wrapped around in the obscene embrace of these formless horrors of the void. Now and again one rose, pulsed upward with a play of impossible colors, and floated against the bone-like rock formations that sheered through his kindred's gelatinous mass. Nadja received the impression that they fed as they clung and poured themselves over these smooth-worn pinnacles. For a long time, she and Savary gazed down speechless at this unbelievable sight. Suddenly, it changed. As though becoming aware of an alien presence for the first time, the whole sea of loathsome forms swirled and boiled over. Over and upwards!

With no perceptible sense of individual action, the very surface of the viscous sea below seemed to curve hungrily upwards in a mounting vortex of vibrating lights and angry colors. The sky around the speeding *Victory* filled with contourless, hovering shapes! The whole planetoid seemed to converge in one instant fluctuating mass, on the audacious visitant from other spheres.

Even through the immense thickness of the space-ship, the death-like cold of the nameless *things* struck with icy fangs. Nadja switched on the great heat-distributors of the vessel to their fullest power. Her breath was already making a thin vapor in the air. Savary waited till the vision-plate was obscured by the viscous, clinging masses, then his hands leaped for the levers before him. Instantly, destruction hurled itself in an all-enveloping swath from every pore of the space-vessel. An aura of crackling flame swept in great, blinding whorls for a thousand feet in every direction! The thin, strange air served as a faint conductor for the first sound they had heard, save for their helmet radios or within the ship, since they had left Earth . . . the thin, high crackle of the death-dealing beams.

Before this outpouring of flame, the *things* melted in great swaths of utter annihilation, but from the fathomless depths of their translucent layers, ever broadening whorls of their impalpable horror poured up in a vast circling funnel that had the space-ship at its core. Warmth began once more to steal back into the control-room, but it was a fluctuating thing. Between the fans of the heat-rays, surviving waves of the *things* bore down and clung, but most of them had been already touched by the destroying flames, their process of dissolution only retarded. It was soon warm enough for comfort within the ship. Without, a vast spectacle of destruction painted the blinding reality of white-hot, Terrestrial flame against the ghastly shimmers of the other-dimensional foe.

● After a while and out of curiosity . . . for the crackling heat-rays were working a vast enough dissolution on the ever-mounting but out-manoeuvered foe . . . Savary released one of the disintegrator rays and turned it on one of the oncoming waves of shimmering viscosity. The result was unexpected. As the almost-invisible beam met the massed transparencies of the Sakka *things*, their fascinated glances beheld one of the strangest struggles man had ever seen.

There was first the impression, conducted more through the psychic senses than the sensory nerves, of a headlong, a more than seismic shock. The beam spread, became a spray of struggling force, fell back upon itself in a shower of terrible sparks. Here and there, however, it seemed to penetrate and sink down within the pulsing beings in long, disrupting spears. Strange waves of unnamed emotion ran through the Terrestrial fighters' nerves. Nadja cried out.

"Something weirdly unreal is happening out there! What is it?"

Savary, eyes glued to the vision-plate, said slowly:

"I think that we are seeing a combat such as never has been on our dimensional plane before. These strange beings are vulnerable only where their material sub-

stance is of our world. Beyond the wall that separates our dimensions, the disintegrator ray cannot function. If they were completely of another plane . . . supposing they could still have an existence for us . . . the ray would not even perceive them. The proof that they are probably an evolutionary branch that has jutted out somehow into our dimension, lies in the fact that there is evidently a conflict between their substance and the destroying beam which we have sent against them. There is probably a modicum of protoplasmic organism in them. Perhaps they are an advanced product of their world, or else a very primitive one. There is no reason why their plane and ours should not be converging one towards the other, or inversely, should not have had a common point of departure from which they are extending in constantly diverging paths."

Nadja bent once more over the vision-plate. The battle of the disintegrator-beam and the other-world substance it was hurled at, had momentarily eclipsed the fiery destruction wrought by the heat-rays ringing the ship. The whole scope of the vision-plate flamed with sprays and plumes of intense brightness. Where the fangs of the destructive radiance penetrated, long holes of extraordinary darkness seemed to extend, for an infinitesimal part of a second, into vistas beyond the scope of the human mind. As she looked down them, the very nerves of her body contracted and shivered! But the Terrestrial ray was losing ground! The showering curtain of back-flung sparks had become a wall. With a short, ironical laugh, Savary switched it off. The waves of pulsing beings closed their fluid ranks and he swung the heat-ray guns at the bow into the sickening light at their hearts.

Nadja said curiously, "But why does the heat-ray reach them?"

"Perhaps because heat and cold . . . even though as varying in degree as the intense cold of these beings shows . . . may be one of the things we share with them. Radio-activity evidently is another. Cold may be their medium since heat is evidently the antithesis of their lives. See! I am using the new density their dissolution furnishes to plane lower still into their atmosphere. Relax a little, Nadja. We may have days of this ahead of us. Thank Heaven! The heat-rays are self-recharging. We cannot afford to stop until we have rayed every one of these beings out of existence."

The girl laughed shakily.

"They give me the most unreal sensation . . . as though a transsensatory horror was trying to press in upon me."

Savary frowned and considered her. Her beauty suddenly struck him, but he put the unwonted thought aside. Then he continued.

"Woman's receptivity is held by some psychologists to be more delicately adjusted than man's. Perhaps these things possess some purely psychic powers, within their own spheres, which they are trying to hurl at us. Perhaps you may have nerves capable of acting as mediums between the dimensional planes. Is the impression very strong?"

The girl straightened and shook herself vigorously.

"Oh! It won't get the better of me. I can control it. Those bombs out in front, are you going to use them?"

"They may not act in the elements of this atmosphere . . . but I think they will. If they do, it is these creatures' finish. Radiumin is the death of matter . . . and that planetoid of theirs is matter, whatever they themselves may be. Release some of them, Nadja."

● The upward swirling vortex of the things had never ceased, but the spaceship sailed within a veritable cocoon of flame through which none of them could subsist for more than a few moments. Settling down to a protracted vigil, Savary swallowed a stimulant that would allow him to go two or three days without sleep if necessary (it had been invented for interplanetary flight) and relaxed a little in his seat. There was little, after all, to do, save steer the ship in its level circlings of the tiny world. Nadja had gone forward to release the bombs, for, as these were

recent additions, no provision had been made for their control from the central chamber.

As Savary leaned forward over the vision-plate, he saw one of them float out and downward like a steel-colored shadow. Curiously, he watched its progress; down, down into depths that every rising wave of transparent beings showed more and more profound, till it was lost from view. Another followed, then another. They vanished . . . mere harmless looking dots . . . in the unsoundable depths below.

Still, the *things* swept up in boiling vortexes! Still they were met by the space-vessel's impregnable belt of flame. Suddenly, their ranks seemed thinner. They hovered in seemingly impenetrable hordes, but at a distance. Only a comparative few pulsed down now to meet the destruction that was stronger than they. Through the thinning eddies of them, Savary glimpsed the distant disc of Lydda disappearing behind the billowing horizon of Sakka. When it rose once more . . . a thin silver dot against the half-glimpsed peace of the remote night . . . Nadja came flying back from the bow-room, the last bomb loosed, and cried: "Look!"

Far, far below, a mere speck against the swimming eddies of viscous-looking horrors, a crawling worm of unearthly blue writhed beneath the living seas of Sakka. Another circuit of the asteroid, and they noticed a dozen twisting snakes of fire crawling like living things beneath the other-dimensional glow. Savary drew in a sharp breath and his face was sombre as he looked around at Nadja.

"It works," he said, "Even as I foresaw it would work on Earth . . . though I never dared test it. Nadja, you are seeing the beginnings of a leprous world, a world condemned, which nothing now can save. Let the *things* that possess it find another home in space if they can. Their planet is dead. That is what radiumin is: leprosy of matter. The only thing that will stop its march now is iron. Somehow, it has no effect on pure iron. As you noticed, the shells encasing it were of that metal. Happily, it is possible to handle it in an inert state and to wake its potency only when it is safely in the bomb. Nevertheless, the compounding of it is a game played with death—not one's death alone, but that of one's whole world as well. One slip, one drop vivified too soon, and the seed of ultimate death to matter is sown past remedy. I thought at the time I discovered it that I would try to find an antidote to its horrible potency, but after careful thought, it seemed wiser to destroy the formula . . . though I could not destroy its existence in my mind. Sakka is doomed; though her doom may take a year, two years perhaps to achieve itself. And the *things* on her are doomed, too; that is, if they possess one grain of organic matter in their beings! You had better sleep now while I watch. Later you can take my place."

They divided the strain and tension of the succeeding days into watches of four hours each. Ceaselessly circling the asteroid, the *Victory* flamed with its endless message of death, but the creatures of Sakka had the blind pugnacity of the bulldog. They swarmed in continuous, malign attack around the destroying aura of their foe: swarmed and perished, while the sense of their hate and their other-world death beat in like a miasma against the consciousness of the two Terrestrials defying them.

Off for Lydda

On the third day, it was possible to notice a change in the attacks of the shimmering translucent tides. The hordes rising against them were mere eddies now compared to the infinite numbers of the first days. On the crawling surface of the planetoid, long snakes of blue devouring canker seemed to hiss and writhe. Above their heads, however, the throbbing light of the *things* appeared to mass in ever-denser reaches. Nadja, returning from the observatory room, remarked with a wan, worn smile:

"They are leaving their planet."

Savary lifted bloodshot eyes from the vision-plate. "We must rise above them, then, and finish our work. Hold steady

for acceleration. I am going to turn on the rear rockets."

As they flashed upward, shearing a fiery path through the hovering masses as they went, the beings gleamed with sullen colors and retreated. When at last they had won to clear skies; when, for the first time in days, they saw the cold brilliancy of the distant stars hang dispassionately above them, Savary halted the space-ship, or rather braked its speed to a comparative hovering. Beneath them, the serried depths of the *things* of Sakka undulated and glowed with their unearthly light; but Nadja's prevision that they were leaving their leprous home . . . knowing it doomed . . . was proven exact. Reaching out towards Lydda, an immense whorl of fluorescent motion was flinging an incredible bridge across space. The *Victory* hurled itself at them like a hound at its prey. Once more the cosmic battle locked foes of two widely sundered worlds in a close embrace. Savary sent the white-lipped girl with him to a needed rest while he swallowed stimulants and bent in grey, unshaven and worn-eyed tensity above the vision-plate. With inflexible eyes, he hurled the destruction of the dimension they had invaded against the ghostly *things*.

Hurtling through space at a speed slightly beyond what appeared to be the maximum of the other-plane creatures' power of velocity, they swept the routed foe with the blazing death of their rays, then reducing speed to that of the great streamer of fluctuating semi-matter, they sped along with it like a visible, fiery doom.

Slowly, the heart of the great whirling spiral began to thin and grow ragged. Out towards the edges, the formless things were fringing out into the void, away from the death that was returning them to their original vapor. Nadja, finding that she could not sleep with the pulsing consciousness of the death-throes of an entire form of life beating in against her senses, came and crouched over the control-board with Savary as the hours sped on. Suddenly, she laid her hand on his arm and pointed.

"Look! Isn't this new wave of them we are overhauling brighter and denser-looking than any we have yet seen? These are visible even without our glasses."

Around them a strange nucleus of brilliancy, livid and loathsome but oddly powerful and luminously ominous, had gathered and thickened. Removing his crystal spectacles, Savary saw that this clot of *things* was effectively visible, as Nadja had said, to the unaided human eye. They hung heavy with threat, and the girl, whose shaken mind seemed to receive the psychic messages of the outer *things*, cried out.

"Somewhere at the heart of this brighter swarm is something vital to them. Their king or brood queen or something. I can feel them at bay and these are nearer to our world than the others. They are more advanced on their evolutionary path! Savary! Isn't it getting colder?"

"Yes," the man answered briefly; then, in a harsh exclamation, "The heat-rays aren't working!"

The cocoon of flame in which they had moved for so many days, safe and invulnerable, had suddenly ceased to be. The great whorl of bayed and fluorescent foe was massing around them, pressing in against the outer end of the vision-plate, clinging in fathom-thick layers against the *Victory's* defenceless outer shell. Within the ship, the cold struck with sharpened, deepening bite! Unearthly and irresistible, it weighed on their wearied limbs, numbed their exhausted minds, increased with every stunned and speechless second!

Savary had flung back the panels of the control-board and was searching desperately for a clue to the failure of the heat-ray guns. Leaning over him, Nadja switched on the disintegrator-beams. Their fangs leaped out at the blanketing tides clinging around the ship.

"It may hold them off a little," she said. "They are nearer to us than the rest!" She gasped. Her breath hung whitely in the icy room. Her teeth shivered. The terrible sense of locked combat between two far-flung dimensions poured into the room. Behind a curtain of back-flung sparks and repulsed destruction, the beams tore their occasional, unnatural holes of impenetra-

ble night through the shimmering tides around them.

"The combustion switch is burned through!" Savary gasped. "They are getting no more fuel! It will take half an hour to mend it!"

Nadja said quickly: "The rockets!"

Savary nodded. "It may kill us, but it is our only chance!"

● He swung on the full acceleration. In one terrible burst of rocket-flame, the space-ship hurled itself out of the gleaming *things'* embrace and out and away from their path at a speed they could not equal. Holding the tearing agony of nearly bodily disruption at bay for one endless minute by sheer force of will, Savary kept his tortured body from falling for just long enough to give the *Victory* a clear impetus towards the free skies. With his collapse, the handle of the propelling rockets was released, their power switched off. The space-ship sped on its own impetus through the void, bearing two limp and corpse-like forms within its icy heart . . .

Savary returned to consciousness first. Crawling painfully towards the drawer where the stimulant-tablets were kept, he swallowed a couple and forced two more down Nadja's contracted throat. There was blood in his throat; blood oozing still from his nostrils. But he was alive, and the limp form of the earth-girl beside him still stirred with a faint mockery of breath.

Drawing himself painfully to his knees, he turned on the braking rockets and tried to form an idea as to their position in space. He had been unconscious a full hour. Where had the blindly hurtling vessel brought them in that space of time? As the powerful drug began to work within him, his mind cleared and he slowly worked out their position on the stellar chart. Speira lay in the *Victory's* wake and uncharted asteroidal orbits lay ahead. He set the space-ship's helm to swing in a slow curve back along the path it had come, then turned to Nadja who was feebly stirring at his side. Bruised and wracked though he felt . . . as though every limb had been torn asunder by the acceleration they had met without drugs or preparation . . . his magnificent strength was returning to his mighty frame. Stooping, he lifted the half-conscious girl to a couch and rubbed her temples with a tonic-oil. Soon she was sitting up and looking around, and Savary began gathering up instruments from within his laboratory with a purposeful air. To Nadja's silent inquiry, he spoke briefly.

"I must repair the heat-rays, and then we must return and finish the Sakka *things!*: follow them to Lydda, if necessary, though they may not be there yet. They evidently intended taking refuge there."

The girl dragged herself to her feet.

"I will prepare some food, then I will help you if you need me."

An hour later, the break in the heat-ray fuel-line mended, they saw Sakka's pale disc lift into the vision-plate. When they slipped on their crystal spectacles, they saw the exodus of its beings had not yet ceased. The vast, undulating streamer of fluctuating light stretched now almost to the moon-like brightness of distant Lydda. Knute Savary uttered an exclamation of satisfaction as he saw them.

"They are slow air-travellers," he barked sharply. "We shall overhaul them before they touch the other planetoid."

As they passed over Sakka, he uttered a shout of triumph. Nadja's exclamation was one of horror. The small world was a writhing mass of bluish burrowing light. Those millions of the *things* that still remained clinging to the soil of their planetary home were dissolving away before their very eyes, and on the livid, barren rocks . . . stripped to the eye for the first time perhaps in the asteroid's life . . . the great serpents of nauseous fire dug and twined, eating sluggishly, but resistlessly, into the bowels of a world.

Savary said: "If the planet has an iron core, it will stop when it reaches that far. If not, it will gnaw away till nothing is left and die of lack of matter to devour. Do you wonder why I refused to give to

the earth the atrocious power of such an invention?"

"It is horrible!" Nadja cried. "Horrible! Look. We are in the rear-guard of the *things*."

● Savary touched a lever and the space-ship flamed once more with its aureole of fire. As though in panic, the *things* spread out and strove to flee before their returning doom. Plowing through them, the *Victory* cut a vast swath that disrupted the thin and stricken remnants of their emigrating tides. They had no fight left. The great whorl of fluorescence was like a truncated, headless serpent writhing ... mortally wounded . . . in space. An hour of increasing acceleration brought them to the Lydda end of the space-bridging streamer. Here that same brighter core of pulsing life that had routed them before turned and pulsed up at them in some desperate attack. But the heat-rays were working now. Like mists, they melted before their blasts and the sense of their dying beat like some hideous dirge against the worn minds of the two within the space-ship.

At last, a complete survey of the skies showed only isolated, fleeing islands of sick light, seeking refuge afar. Savary spoke hoarsely.

"It is nearly ended. Hold on now. I am going to give her all the acceleration we can stand. Those *things* must be destroyed to the last one."

That last day was a nightmare in which the inhumanly driven Terrestrials moved with leaden limbs and numbed minds. Every nerve within them shrieking for surcease, the two hurled the flame-belching space-ship after each fleeing composite of *things*. When at last the shattered peace of space held no more of them, Sakka lay far in the rear and Lydda lifted like a moon athwart their bow. Nadja was reeling as she walked, and her eyes were two dark holes in the ghastly pallor of her face. Knute Savary's eyes softened as they looked at her. He wondered how so frail a thing could have proven in the testing as resistant as the strongest man. The fiery empire of Savary's mind had kept his senses so much the servants of his demiurgian will, that emotions found few ways of reaching them save through the barriers of his brain. It was Nadja Manner's steel-like power of will and courage in front of almost inconceivable situations, the determination that informed her fragile frame and the trained lucidity and dauntlessness of her mind that suddenly inspired his respect. As he bent on her a look of interest such as he had given to no woman before, he noted for the second time the haunting shadow of the fiery and untamed beauty that had been hers on Earth, glow through the veil of her exhaustion and pallor. He spoke sincerely.

"There is no man on Earth who could have proven himself a better companion in such an ordeal as we have just passed through than you have done, Nadja. I am beginning to think I owe you thanks for your betrayal of me on Earth. I see now that the justifications I gave myself for my desire to be ruler of the earth were false. However well I might have led them, its peoples had a greater right to liberty than to well-being or even life, which is all I had to offer them in exchange. My exile was merited."

The girl drew in a gasping breath. Then she said quietly:

"Not such an exile. Do you think that every minute I am not realizing what I sent you to . . . and that the earth may die because I did it?"

Savary stood up and stretched.

"In an hour we shall be hovering over Lydda. We can land there and rest, if it be an auspicious planet. We'll need two or three days of complete inaction before either of us will be fit for anything. I am telling you that you were right, Nadja. We need never talk of this any more. Whatever you did, for whatever reasons, your coming into this spacial exile cancels it generously. After all, what adventure on Earth could even approach the vastness of our adventures here? Whatever the future may hold for us, we can think that we have lived as no human has ever lived before. Defying cosmic forces,

bending over the tomb of a million-year-old past, and destroying the possible brood of a fantastic future. And now . . . let us land on Lydda."

CHAPTER VII

The Bird-Men of Lydda

● Lydda gleamed . . . a clear red disc . . . across two-thirds of the vision-plate when Savary woke Nadja from the needed sleep he had sent her to. An hour later they floated above a barren soil, granite-red and airless and fashioned into tormented outlines of jagged peaks and deep fissures a hundred times more fantastic than those of Speira. Slowly, the *Victory* sank downwards towards this bleak scenery, coming to rest finally in what looked like the center of a one-time volcanic crater, as wide as a small sea. For a brief moment they held fatigue at bay while they looked out at this now corpse-like world through the uncovered glassite dome of the observatory. They had come to rest deep in a red powder of desiccated matter. Around them, sharp black peaks stabbed the starry skies and cast inky shadows under the brilliance of the distant sun. An age-old, weary death lay over this airless world. Savary spoke.

"I thing that we can safely sleep here. This is almost a lunar scenery . . . it makes one homesick for the mineral lands of the moon."

Moving warily on limbs that tottered beneath them, they gained their rooms to forget all the strain and stress of the endless days of other-world combat in the dreamless sleep of exhaustion . . .

For two days, the space-ship lay undisturbed in the age-old silence of the dead planetoid. Its crew slept and woke to briefly eat and sleep again. On the third day, Nadja woke to a renewed glow of vitality, all fatigue gone. Taking a cold shower and dressing quickly, she found that Savary had flushed the air of the space-ship with a bracing, extra touch of oxygen and was doing setting-up exercises in the small gymnasium the World Council had included in the equipment of the *Victory*. After breakfast, they flung back the shutters of the observatory and looked without. A rising sun was beating like a molten hammer against the ruddy rocks of Lydda. It was a small world, they had seen on their arrival two days before, but its revolutions on its axis were so slow compared to those of Speira, that the days were only two hours shorter than those of Earth. This they were to discover later. At the moment, they inferred it as they watched the far sun climb slowly across the black heavens, while the shadows shortening across the baking rocks made the only hint of motion on the silent world.

Suddenly, as they watched the airless sunrise, a tremor shook the mighty hull around them. Slowly . . . as things move in a dream . . . the nearer black peaks began to move, to glide past them! "The ship is moving!" Nadja cried.

Dashing into the control-room, Savary flung on the braking rockets, but its flame hissed out into the silent world in vain. With the floating motion of a swan, lightly as a feather moves, the *Victory* passed over the barren, powdery soil with a quicker and quicker glide. Tense-lipped, the man within turned on rocket after rocket with no perceptible result. The space-ship was slipping . . . propelled by what strange agency neither knew . . . towards the bowl-like vent at the crater's heart. Suddenly, they were looking into the black depths of a cavern-like fissure, immense and impenetrable. Savary was flinging on the last of the braking-rockets when Nadja leaned forward and laid a hand on his arm.

"Perhaps I am mad," she said. "But something within me . . . something like an echo from an outside voice . . . is saying and repeating that the power that is holding us is friendly, that we must not fight it."

Savary frowned and stood still in deep thought. Suddenly, as though on impulse, as though some message had reached his inner-self also, he walked across to the radio-receiving set and switched it on. A low hum purred across the room; then . . .

words! Unintelligible words, but distinct syllables that droned and paused, then the rhythm changed as though they were spoken in another tongue. Nadja flew to the radio-transmitter and spoke into the microphone.

"Who are you? We do not understand your language."

The voice paused a minute, then in slow, halting English, it said: "We are not enemies. Our beam of force is drawing you towards the entrance of our world. If you want to fight it, turn on your rear-rockets and outstrip it. It is strong, but very slow. This is proof that we do not wish to hold you unwillingly. Our world is at the heart of this planet. If you wish to come here and exchange your wisdom for ours, allow the beam to pull your ship through the crater opening ahead of you. In two hours you will be in an atmosphere composed of . . . say the names of your atmospheric gases, please, through the speaker you possess. Ah! Thank you. Here is the composition of ours."

A brief atmospheric formula was given and the voice ceased. Savary walked to the transmitter and answered.

"We would be pleased to visit any friendly people whose minds are so developed as to be able to seize on a new language and use it instantly as you have done."

Nadja flung herself on a couch and laughed with a new gaiety.

"'There are more things in Heaven and Earth than are dreamed of on one planet'," she misquoted. After the two days' rest, her eyes glowed and her cheeks had recovered their color for the first time since the strain of her stowaway flight from Earth. Savary stretched his superbly muscled form and felt, for the first time since his athletic youth, the simple, uncerebral pleasure of being alive and healthy. The slightly over-oxygenated air of the ship stimulated them to a leaping vitality. What was ahead of them seemed only a pleasant adventure after those they had encountered and outfaced. Other beings were alive in this desiccated world! Other minds were reaching out in friendliness towards theirs! Only he who has tested the supreme isolation of the void could appreciate the exhilaration of the thought.

The space-ship was dipping towards the vast black entrance of the crater-mouth. "Volcanic stone," Savary said, "but unlike anything we have on Earth. I wonder if these beings will be of any shape kindred to ours."

The next moment they were engulfed in total darkness. The ship lurched. Then they were plunging down some immense gap in the dead planetoid's crust, hurtling towards its bowels at a speed that had become vertiginous, while the lights of their vessel gleamed in the reflection of the vision-plate on smooth, basaltic walls and seemed to be hurled back on them from the impenetrable night ahead.

● Suddenly, they seemed to slip into a vast, metal-lined tube where immense doorways folded back before them at their approach and swung to behind them. For an hour, they slipped smoothly down and Nadja grew restless. The silence and the continuous hurtling through the Stygian night of a planet's heart had quenched her gaiety if not her courage. She looked often at Savary who sat with creased brows, immersed in a deep abstraction. He seemed to be listening to something, or for something. Suddenly he smiled.

"We shall be there in a few minutes," he said.

The girl asked curiously, "How do you know?"

"I have just been told so in the same way, only more clearly, that you were made to feel that these beings were friends. After all, we have mental communication in our world also . . . not perfected, it is true . . . but nevertheless recognized. I have been letting my mind respond to theirs. I think you can probably do it too, if you try. We should have no trouble communicating with them."

As he spoke, the space-ship faltered and came to a stand-still. Eagerly, they bent over the vision-plate. They were in a vast amphitheater of smooth black rock, whose

walls reflected the light which poured upon them from some unseen source high above their heads. It was as light as day.

Through the radio, the voice said distinctly:

"There is atmosphere around you. Perhaps you had better see if it is suitable to your capacities."

Nadja walked over to the atmospheric reader and said after a few minutes: "The atmospheric pressure is slighter than ours . . . about that of our higher summits . . . but the composition is nearly that of the Earth. Look. Here is the reading."

As Savary bent over the test-tube, she looked into the vision-plate. The ship had come to rest in a huge cradle of black metal, and on a narrow platform beside it, a strange shrunken semi-human form stood peering at it. As though he was aware that she was looking at him, he lifted one arm in a sort of ceremonious salute. Savary spoke.

"I think we can risk going out without our space-suits. These creatures seem solicitous of our well-being."

Strapping disintegrators to their sides and filling the air-locks from the reservoirs of the ship, they stepped out into this new world. The air which they dubiously drew into their lungs was strangely pungent but apparently harmless. Above them, the vault of the cavern in which they found themselves lifted till it almost lost itself in the upper distances. From a whirling incandescent globe . . . a ball of sun-like brilliancy a hundred feet or so in diameter . . . a warm and dazzling light poured down upon the space-ship, its cradle and platforms surrounding it. Narrow runways bisected the entire floor of the cavern, and the whole appearance was that of a very modernistic airway station.

The dried-up-looking being that Nadja had seen through the vision-plate walked up to them and saluted gravely once more. He was, they saw, a bleached and dwarfed old man with strange feathery arms of a bird . . . arms that looked as though they had evolved from wings and ending in many-fingered claw-like hands. Feathers grew in a close grey cap over his bony skull and his eyes were enormous in a wizened puny face. He wore one draped garment of some metallic tissue, and his feet faltered as he walked as though he was not used to demanding much of them. His voice was sonorous and pleasant, however, as he greeted them in English of a slow, measured style.

"Greetings. Your language is an easy one to absorb and resolve, but it has no kinship with that of any of the worlds with which we are acquainted. We saw your space-vessel resting on the edge of the crater that is one of the gates to our inner world, and we were curious to learn who you are. In the nearly half-million years that Lydda (I see that is the name you give to our planet) has lain barren and stripped of air, none have come here, nor have we seen other signs to indicate that space-travel had become feasible. You may accompany me without fear. Knowledge is all we ask of you, and we will give you some of ours in return. Follow me . . . . if it be your will."

Savary spoke slowly. "We are people of a distant planet called Earth. It is the third from the sun. You, I suppose, are the original inhabitants of this planetoid who have fled here from the airlessness without?"

"Even so. Will you step into this conveyance? . . . thus . . . and in a few minutes we will be where the Older Ones . . . the rulers of our world . . . await your coming. Since first our atmosphere began to leave us, we have dwelt here within the core of our planet, sealed from the airlessness without by metal air-locks and creating our own atmosphere by machinery. Ah! Here we are."

The small metal shell into which they had stepped had slipped . . . moved, like the space-ship, by some invisible force . . . through a succession of low passageways hewn out of the black basaltic rock till it came out into an indescribably vast cavern . . . a veritable inner world . . . where it rested on the edge of the terrace of a great building which overlooked a descending panorama of other buildings all bathed in the vital brilliant glow they

had seen in the first cavern. The air radiated with a warm energy that came from the almost invisible source of the light. No vegetation whatever existed within sight, and all the buildings seemed made of some dark metal that would have been depressing without the diffused radiance from the heights. Their guide led them through a large doorway into a lofty hall which was plated in a bluish metal of many delicate reflections, where a group of tiny feathered men sat behind a white table of some quartz-like stone that ran half-way across a raised dais. One rose and came forward with fumbling steps. Nadja felt that he was walking, even as their guide, as a sort of courtesy to the guests of their world, but that this was a very unusual form of exercise for these people. This little feathered man looked hard at Savary and then smiled.

"You are of the higher mind," he said in groping English. "We can then dispense with the talk of the tongue that our people have abandoned long ago."

● Savary bowed. He looked steadily at the little man and suddenly Nadja began to sense an interchange of thoughts between the two that grew clearer as she set her own, not negligible mind, to follow it. She saw the eyes of the seated council turn on her with pleased approval as the meaning of their thoughts became clear to her. Their mental speech flowed with a speed far beyond that of their verbal talk. The leader who had welcomed them waved them to a seat with one feathered arm. He then spoke . . . or rather thought.

"We have looked into your minds . . . with your consent, of course, since otherwise we had not the right . . . and found that you come from the planet that is at the meridian of its life. We call it Tellus; you call it Earth. We have not looked on it with material eyes for nearly a quarter-million years. In that time we have never gone to the surface of our globe, but our inner vision has viewed it and all the others of the solar system and noted its material evolution, though we had no means of noting whether it possessed inhabitants or not. We are glad to see that its people are of so high an order of evolution; high enough to have conquered the barriers of space which we considered insuperable. Will you tell us what brought you here?—whether it was a mere thirst for knowledge or a more virile . . . and alas! . . . lost to us . . . taste for adventure that made you launch yourselves into the planetary void? We would like to know what such flights across space have shown you. Here life has left us little to stir our blood save intellectual facts. Too much safety, too much knowledge, has sapped the springs of our emotions. We dream and think and remember. But yours, we can see, is a younger race than ours; a race that acts, where we have only meditated."

As he finished, the Terrestrials felt the surge of thoughts reaching out and questing into theirs. Savary's mind attuned itself almost immediately to the rhythm of thought-exchange, and in brief succinct thought-phrases, he told of their coming to Speira, of the onslaught of *things*, and the destruction of that planetoid and its shimmering hordes. As the council listened, soft mental notes of interest accompanied his story, like the vibrations of a shaken record. As though only a certain number of minds could follow a tale told by one, three or four of the Older Ones turned their thoughts to Nadja, and, stumblingly at first, but with a growing firmness as she proceeded, she took up a part of the burden of the tale. A great help to the two Terrestrials' first efforts was that extraordinary sense of peace and calm and remote philosophy that pervaded all relations with these shriveled bird-like people of inner Lydda. It hardly needed the history the council leader, whose name they learned was Glom, told them in answer to their many curious questions, to show them that they were in a world where the intellect alone was king—where age had turned all emotions into sifted ashes, cold and still and quiet, save for those feelings that held their roots fastened in the mind.

Glom told them that the people of Lydda had followed an evolutionary course not unlike that of humanity, with the differ-

ence that the lighter gravity allied to air almost as dense, had favored the evolution of the reptilian lizard and subsequent bird off-shoot of the common life stalk; so that, in the struggle of nature, the prize of evolutionary adaptability had gone to the biped oviparian species, equipped in their primitive days with wings which had slowly atrophied as the race became more civilized and therefore more physically decadent. However, the construction of their bones had remained, even across the ages that had transformed them, so light as to make floating and gliding a feat possible under the slightest motive power. Therefore, they seldom walked. They had reached sovereignty on their little world some two million years previous, and a particularly benign dominance . . . with but few bloody pages to its record . . . had held sway over the little asteroid for uncounted generations, till the same doom as that which overwhelmed Speira had come to them.

● "When first we noticed the fatal leaking of our life-giving atmosphere into space," Glom said, "we were at what was probably the highest peak of our racial vitality. Though we felt that we could not fight against the law of the cosmos itself, we found it not too hard a matter to burrow deeper into our already honeycombed world. Therefore . . . after installing means for manufacturing all the necessities of life here, and preparing ourselves for what our scientists foresaw as an eternal exile from the surface of our planet . . . we turned our backs on our dying upper world and emigrated in our thousands to the caverns you see here. Since then, subsequent scientific inventions have made of this inner world a place devoid of any need of effort. Science serves our every need. The beam of force that drew you here can be modified so that it moves houses for us or builds machinery to replace that which wears out. In lesser form it attends to our household needs and mechanisms, so that denied the stimulus of the hazards and changes incident to a life on the more exposed surface, we have sunk into what is in some ways a rut of peace and purely mental researches."

His thoughts ceased to use words at this point and lapsed into swift mind-pictures of the Inner World of Lydda. Savary and Nadja saw thought-images of spacious streets and houses; vast laboratories where all that was necessary to the comforts of this ancient race was created; libraries and scientific equipment that lit an eager light in Savary's eyes. There were luxuries here undreamt of on Earth. But everything was static, unmoved by the fluctuating tides of Change. The whole planetoid seemed to exist in a sort of Nirvana of the senses, a dreamy achievement of all things mental, with a consequent indifference to purely physical or emotional ambitions. The meanest dweller here was wise beyond the most brilliant man on Earth (with the exception, perhaps, of Savary) but the urge and vitality of life had withered, or nearly withered, within them. Nadja, following the thoughts of the older ones through the pageantry of their world, thought of a lethean domain of aged brilliancy and knowledge, of effortless brooding over fountains of immense wisdom that mirrored everything attainable throughout the universe but gave forth no vital gush of productive waters. Here was a race that had attained a goal and chosen to go no further. There was a sense of immense age, of static, brooding knowledge about them that set them apart from the life-stream that, elsewhere, poured itself in alternate throbs of destruction and creation throughout the cosmos.

One of the Older Ones reiterated what had been said to them over the radio.

"We wish to exchange knowledge with you both. Are there things about the cosmos you would like to know? Mayhap we can tell you some of them in exchange for what we now lack . . . the wisdom that comes of actual physical contact with facts. We have already learned much from you. We have known for long of the existence of the Néara of Sakka . . . for that is the name we give them . . . but of their actual potentialities and origin we

were ignorant. Your belief that they are advanced forms of life in another dimension that have slipped over the invisible border-line into ours interests us. We of Lydda have extended our knowledge of the other dimensions as far as it is possible to go . . . to that barrier which we have thought, so far, impassable. As you believe, it is our psychic sense which serves as a bridge of sorts between the two planes. Now you have given us occasion to believe that the barrier may be slipped through . . . at least from the opposite side . . . by the path of evolution, working there as it works here. This strengthens the belief held by our most advanced scientists that both dimensions are part of the cosmic plan and that some day the converging paths they are taking will merge them and create an immense struggle in which co-existent worlds, as well as co-existent life, will meet in an epic battle for existence in one single dimension . . . or rather a welding of both dimensions into one single plane that will form the nucleus of a new system."

Telxon of the Older Ones

● When he had finished, they had left the council chamber for a short tour of the Inner World of Lydda. Dispensing with cars, the Older Ones suggested that the two Terrestrials should try the mode of locomotion usually adopted by the Lyddans for short distances. Nadja and Savary were therefore furnished with two belts equipped with small inner-power generators . . . boxes no bigger than match-holders ranged on the inside of each belt . . . and instructed in the use of them. The Lyddans wore these belts continually, discarding them only at night. A series of small buttons on the outer side of the belt released the amount and kind of power required (there was an attracting force as well as one that could lift or push things as small as a door latch or a button) in the form of beams that propelled them where they wished. The effect was remarkably like flying, but wholly effortless. Nadja thoroughly enjoyed it, but Savary was too deeply absorbed in the information he was gathering and exchanging in his communion with the bird-like ancients around him to pay more than a cursory attention to the mere mechanical inventions about them. Later, however, Nadja found that most of what they were shown had been automatically noted and filed away in the capacious recesses of his mind, and that some of the inventions of Lydda were to serve as a point of departure for others of his own.

Mechanically speaking, the Inner People had stopped their development at a point where their comforts were satisfied. They had light and heat and atmosphere; power, to every conceivable degree, at their command; synthetic foods that the Terrestrials found, after experiment, to be palatable though monotonous, and other things similar to what Glom had showed them on the second day of their stay there. Bringing them to a great side-cavern reached by one of the smooth metal-lined tunnels that formed the usual system of communication between the more distant points of their subterranean world, he showed Nadja and Savary row upon row of strange metallic forms; robots which Glom said were activated by a special magnetic beam to enable them to do all that living entities could achieve, save feel and think.

"Two thousand years ago, all work was done here by means of these robots," he said. "It was in that time that we discovered that our race was losing almost all of its physical vigor. For long, this fact gave little concern to the Older Ones of the time, since the mind has always been considered more important than the body; but after a long while, it was discovered that the mental powers of the younger generations were decreasing. Researches which were at first disregarded, then impossible to ignore further, revealed the fact that the correlation between bodily development . . . not merely health, for that we knew already and had taken steps to preserve, but muscular balance and efficiency . . . was closer than we had ever realized. Since then we have re-imposed upon ourselves the physical burdens we

had sloughed off as handicaps to our mental development, and, although it will take another five hundred years perhaps for us to achieve any definite progress in that direction, we are once more aiming at that perfect balance of body and mind which we now know can alone produce the most from the accompanying mind. You will see that we have gymnasiums for those young enough to benefit by them and each of us must do our share of the physical work of the planet. This, of course, is very slight . . . we still use our machines to free us of common drudgery . . . but the mechanical servants, at least, have ceased to form a part of our lives. None may use them; though if great danger threatened, they could, I presume, be put into commission once more."

Another Older One walking, or rather gliding, beside Nadja, added, "you yourselves serve as a powerful proof of the truth of this theory which we so long disregarded. The physical development of your friend is extraordinary to us who have let our muscles waste away for so long, yet we find his mind the equal of that of the best of us here. There are, of course, some fields of knowledge in which he is not our equal. That is inevitable, since it is evident that you both belong to a vastly younger type of evolution than we do. Nevertheless, it is patent to us that the development of his mind represents something individually more advanced than what we have achieved, and more balanced. You yourself have a form of female mind far ahead of what our race had produced at your stage of evolutionary development. Your passage through our lives will serve undoubtedly as a stimulant to many of our lagging activities."

Nadja glanced at Savary; at the vigorous symmetry of his lofty figure and the Olympian modelling of his head. Standing in the vast cavernous reaches of the resting place of the robots, he looked like a Titan among the small, wizened sages of Lydda. His eyes glowed with a cool, keen light as his mind communed with those of the members of the fabulously old and wise race around him. He was drinking deeply and thirstily, Nadja felt, of a fountain he must often have longed for among the inferior mentalities of his own planet. As they moved through basalt tunnels and past the cold hearths of ancient volcanoes, over metal towns bathed in the brilliant radiance of the life-giving light above, floating always as though provided with wings, Savary and the Older Ones near him seemed equally to glow with the cold flame of mental communion as the exchange of knowledge between them flowed on a medium far swifter than words.

● The bird-men treated them with a grave and dignified hospitality. At the end of their day they were given adjoining rooms of great airiness and height, roofed with a transparent glass-like substance that allowed the beams of the outer light to penetrate easily, but which it was possible to darken through some agency that clouded the crystalline roof with a suffused and restful green, like the darkness beneath dense forest boughs . . . the loveliest of all darknesses in which to sleep. The rooms were bare of any furniture whatsoever. Each article was summoned as needed from recesses in the walls. Nadja's first experiment with the imposing array of push-buttons set in the walls set a panel of the metal revolving, on which a low lounge appeared with two broad chairs and a small table between them. Another attempt produced a mirrored recess flanked with cupboards for clothes, and a third finally revealed a bed; a high, nest-like arrangement to which they had to waft themselves by means of their power-belts.

On the second day, a banquet was given in the great council hall. Savary, anxious to get back to Speira and the vast undertaking left in abeyance there, had announced their departure on the morrow. A hundred or more of the Lyddan leaders assembled, not to eat . . . eating was done privately and briefly without any symptoms of enjoyment . . . but to drink of a crystal-clear liquid, aromatic and strangely luminous, which possessed, they were told, an extraordinary power of stimulation

over the mind and psychic powers. Glom warned them to use it sparingly as they were not immunized, as the Lyddans were, against its effects.

"Enough of it will render almost transparent the intangible wall that divides us from other planes," he said. "It would probably take much less of it to bring you to such a stage than is now necessary for us. It might be, indeed, that your system would not respond to it. Nevertheless, you had better use it warily."

As they half lay, half sat in crescent-shaped chairs, the cross currents of thought-talk seemed to flow like some invisible ichor of the gods through the vibrating air. Wizened though the little bird-men were in physical appearance, their minds were those of demi-gods; demi-gods of a satiated and wearied race, perhaps, but with the accumulated wisdom of unplumbed ages stored within their minds, and flowing freely now from one to another as the Pulnore (this was the name of the crystal sparkling drink) stimulated them to an unwonted vigor of interest. Nadja felt as though her mind were turning the pages of uncounted ages of future wisdom as yet sealed against the eyes of Earth. Science as yet undreamt of by man unfolded in that strange interchange of thoughts. Whole realms of the known sciences of Earth shaped themselves into clearer and newer domains as the knowledge of the ancients of Lydda flashed across the air. She saw that mankind was . . . despite its vast strides forward of the last few centuries . . . merely stepping across the threshold of thought and knowledge, that a vast sweep of centuries still stretched between them and the degree of civilization to which the Lyddans had attained. And then she remembered that this sweep of years might never be crossed. Doom was reaching out for the earth. As though a jealous cosmos feared the conquering power of the organic mind, the cosmic death that awaited all planets waited not for the decline of life on their surface to seize and strip them of air. Unless the dwellers of Earth learned to defeat their doom as the Lyddans had done, their race would be run before its possibilities had more than budded. She wondered how many advanced forms of life had been extinguished thus by the relentless laws of planetary life and death. As her mind shivered back from the vast spectacle of cosmic waste and remorselessness against which her small humanity seemed to shrivel and sink in its own helplessness . . . no more than a speck of dust flung out into the wastes of time and space . . . she hardly noticed the frequent sips she was taking of the crystal liquor before her. It was only when the aged men near her began to take on indeterminate outlines, like fusing glass, that she realized, too late, how much of the potent liquor she had imbibed.

● She felt as though her whole being was enduring a transmutation into some fluid state or existence against which she could neither fight nor object. Her mind and consciousness were afloat on some stream whose borders seemed unmeasured by Time. Matter around her had assumed a semi-transparency that seemed to fluctuate and grow as she looked, till it took on the aspect of some tenuous veil behind which strange shadows moved and had their being. Skies of no known color gleamed above cities of no describable shape. Time seemed a material substance in a world where matter was a fluctuant, impalpable thing. The pulsing of other-world passions and the beat of unknown life-streams seemed to vibrate like throbs of unimaginable light through the transparencies of an alien realm. It was like being immersed within a cloudy crystal sphere under the waters of an unbelievable sea where half-seen shapes sent the vibrations of their being through a medium that had no existence for them. Now she was gazing into fathomless depths of lucent matter and the sense was clear in her that these depths were the undercurrents of time! that they were moving in an infinitely slow progression towards some static world whose barriers were her flesh and blood, and other organic limits of Matter and Time. Beneath the dimensions known

to man, these undercurrents were shifting and welling and breeding their own forms of life, the while, like a slow flood, they flowed ever closer to the sundered plane where humanity had its being. As she floated in some dim world of dissolving fantasies poised above unattainable realms, planets that followed cosmic rules, yet possessed no imaginable cosmic shape or substance, reeled through skies of impossible light. Then . . . slowly, laboriously, as though it fought its way through some inhospitable medium . . . a pungent smell broke through the transparencies and bodiless existences around her. She came slowly back to a sane and concrete world. Savary was bending over her with a look of strange concern in his eyes, holding a flask of green liquid to her nostrils. As she sat up, the Lyddan Older One beside him began to smile.

"I told your friend that you would come back," he commented. "The barriers between are still impassable, though in a few more million years they will have grown very thin. All we can do now is to see dimly and strive to understand."

Savary straightened and spoke briefly. "I though you were dead. I looked around at you suddenly and you had fallen into a sort of trance. Don't take any more of that damned liquor!"

Nadja shook herself and smiled.

"I won't. But it was worth experiencing. I think I have looked into a world where Time is Matter and what we call Matter has no being. It was like looking through the walls of one's own atomic structure at something co-existent with us, yet infinitely removed from our reach."

The Older One, Glom, said; thought, rather: "We know that the universe was once one single atom . . . an atom whose mass was equal to the mass of the whole cosmos as it now is . . . and that the universe represents the disintegration of this atom, but not its annihilation; only its transformation. Our wisest scientists believe that a twin atom of equally fabulous mass, holding likewise within itself all the elements of a universe, may have existed co-relative with ours at the beginning of all things, and may have developed within the same sphere and place but on a different plane whose elements could never even encounter each other."

Nadja asked curiously: "What is there in that drink to make one see, even though dimly, through the wall between us?"

A very old and wrinkled bird-man answered.

"We hardly know ourselves. The formula of Pulnore does not respond to analysis. Each component part of it has no potency without the others. However, the very existence of two worlds in an identical point in time would create some impinging vibrations . . . not material, since there is no point of material contact, unless, as your friend believes, it may be temperature . . . but purely psychic. Probably the Pulnore speeds up the receptive powers of our more delicately attuned psychic senses to the point where they are automatically translated into terms of material understanding such as vision. The effect you have just experienced is not unusual with us."

It was late before the banquet adjourned, but Nadja, feeling Savary's watchful eyes on her, left the sparkling Pulnore severely alone, though a strange desire . . . like the plucking of ghostly, other-world fingers . . . made her eager for another immersion into the strange currents that flowed past the barriers of that other plane. Before they retired to sleep, to their last sleep on Lydda, Glom spoke to them.

"We have decided to offer you a few of our mechanical men to help you in the gigantic task of reviving our sister planet, Speira. To you they will not be harmful. When you have finished with them you can either destroy them or store them somewhere for future eventualities. They will simplify your task greatly, as will also the power-beam which shall accompany them as our gift to the first ultra-planetary visitors of Lydda. Will that be pleasing to you?"

Savary expressed their appreciation, and then the Lyddan continued.

"We have been looking at Sakka. The

iron core of the planet has been reached by your creeping destruction and it has stopped its work. In case there be any spores or germs of it remaining in dormant potentiality on its surface, we are sending out, on a beam of force, a repellent of the same nature as your repellum, that will render its pitted and gnawed core of metal forever hostile to any form of mineral or organic matter. Otherwise, it might have remained forever a menace to the organic worlds of space."

● On the morrow . . . after a brief lesson from the Older Ones in the use and management of the robots that had been loaded on their ship . . . the Terrestrials made ready for their departure. Rested now and relaxed, they were eager to return to Speira and to finish the interrupted and vast achievement awaiting them there. The whole council of the Older Ones accompanied them to the great landing cavern where the *Victory* waited. They made a survey of the space-ship and commented favorably on the many inventions of Savary's genius with which it was equipped. Savary offered to bring them out on a trip into space . . . the space they had not seen since a half-million years . . . but Glom refused in the name of all.

"We represent age," he said, "and age has lost all taste for sensation or change. We are content to range with our minds. We hope that you will come back to us when your work on Speira is finished. Perhaps by then the leaven of your passage with its breath of younger and more vital ways may have stirred up a taste for adventure amongst the youngest of us. That is possible. In the meantime, go with our good wishes. Our knowledge will follow you as far as it can."

"If we are successful in returning air to Speira, would you like us to do the same thing for Lydda?" asked Savary.

The Older One shook his head. "We presumed you would make us this offer. After reflection, the council has decided to refuse. We have peace and plenty and happiness here. Why seek change? If you would give us the formulae of your invention, we might like to hold it against some future eventuality that might necessitate our return to the surface; but for the time, we are satisfied with the life we possess here."

The engines of the *Victory* had been switched on and their almost imperceptible throbbings animated the cradled ship. The last Lyddan had descended from the space-ship and Glom waited only for the closing of the small side entrance to give the signal that would propel the vessel upward through the metal-lined tunnel to the surface. Suddenly, there was a slight commotion amongst the gathered Older Ones without. One of them was pushing his way on fumbling feet through their feathered ranks. The plumes of his head were quite colorless with age and he seemed animated with a throbbing excitement that sent hurried thought-calls through the air ahead of him. Nadja paused as she was swinging the air-tight door closed. The ancient bird-man hastened to the foot of the ladder hanging from the sill. On a beam of force, he swung himself up into the doorway, and she saw that he carried a heavy bundle in one hand. His thoughts hurriedly explained his presence and his breathlessness.

"I have decided!" he cried mentally. "Take me with you to help in the revitalizing of our sister world! Our race has been inactive too long. It is time that we relearned to adventure with our bodies as well as our minds."

Emotion showed on the faces of all the gathered Older Ones. Their thoughts made little eddies around them. Glom turned his mind towards Savary.

"This Older One is one of our greatest chemists. He will be of great help to you should you find and try and re-animate the sleepers of Speira. I think you will not have occasion to regret taking him with you, should you grant his plea."

At a nod from Savary, Nadja held out her hand to the daring sage and drew him within the space-ship. The feathers of his skinny arm were quivering with emotion. The door clanged shut behind them. Within the control-room, the soft hiss of the

charging rocket-tubes purred like a dynamo under water. There was a slight jerk as the beam that had brought them there took them in tow and the long trip to the surface started.

Nadja gave the old Lyddan, whose name was Telzon, a room in the forepart of the ship and saw to his comfort. He was still panting slightly, less, she thought, from the speed he had made to catch the *Victory*, than from the emotions incident on making his decision. After all, for a member of a race that had, despite its brilliancy, been static for a thousand centuries to suddenly awaken to the call of adventure, represented a psychological revolution of no small moment.

The red rocks of Lydda were glowing moltenly in the untempered sun when they emerged upon the surface. Telzon's eyes grew suffused with emotion as they rested on the desolate remains of the outer world that had bred his race. Savary felt a pang at his heart as he read the old bird-man's expression. How long would it be before the lush and smiling Earth would be like this air-stripped and desiccated world? Could he wrest from his fertile mind a means by which the insuperable gulf that separated him from her could be bridged so that the message that might save her could be flung forth on time? A fierce eagerness to be back on Speira, back at the task of recreating her vanished life, welled up within him. At the same time, a defiance of the pitiless laws of space lifted his heart onto a plane where he was no more a mere pigmy of infinitely frail flesh and blood, but the source and origin of a force that would defeat and render impotent that cosmic destruction that withered whole worlds and took no heed of such minute matters as organic life.

As the space-ship hurled itself into the now familiar void, the bright arrow-tip of Earth launched its beam of light at them over the highest of the dead planetoid's peaks. The lunar world sank away beneath them and the bright flares of the distant stars burned coldly against the unrelieved night. Savary lit a pipe and paced up and down the control-room, while Nadja turned on a soft musical instrument and lay at languid ease listening to the strains of Terrestrial music. Telzon hung, fascinated, over the vision-plate, his mind flashing endless questions at Savary. The warmth and brightness of the spacious room seemed like a challenge flung at the icy serenity of the eternal night without. Speira gleamed silver-pale ahead of them. Her two small moons swung across their path; her bright disc grew and lifted and called to them . . . a planet waiting for deliverance from a cosmic death.

CHAPTER VIII

The Revolt of the Robots

● The brief span of one more airless day had drawn to an end. As the rayless sun dipped below the inky peaks of Speira, plunging the planetoid into its oppressive spacial night, Savary, standing with a Lyddan beam apparatus in his hand directing the work of half a dozen Lyddan robots, looked up at the suddenly unrelieved darkness with satisfaction at the deliverance from the stark glance of the untempered sun.

He was standing in a vast plain that was fringed in the far distance with a saw-toothed edge of jagged peaks; the location chosen for the last of the great machines that would bring air back to Speira. The footsteps of time had levelled everything here to a uniform smoothness. Probably, Savary thought, this part of Speira had been the agricultural heart of the asteroid, but even the beds of the rivers that must have watered its one-time fertile reaches had vanished under the velvet dust of desiccation into which the surface soil had resolved itself. Only the practically completed vast web of the neutron-beam projector relieved the powdery flatness of its forgotten spread.

With the onslaught of darkness, the robots that had looked like grotesque shadows a few minutes before became visible only through the gleam of their headlights as they welded the last stelumin beams into place, the heat-rays in their unsentient hands sending out showers of sparks into

the night. Across the distant hills, an approaching rocket-boat caught a last gleam of sunlight as it rose to clear the peaks. It was Nadja bringing the last piece of metal needed to complete the great structure of web-like girders and to finish the mighty task they had undertaken.

As the craft sank to earth, Telzon as well as the girl stepped from it. This was unusual, for the old bird-man rarely left the space-ship where his vast store of knowledge made him invaluable in the laboratory and released the Terrestrials for other work. Even with the aid of his Lyddan beam-belt, his frail build found the weight of a space-suit oppressive. Indeed, without it he would not have been able to move at all outside the ship. Now, as he floated down on the propulsion of the controlling beam, Savary sensed that only some worry or anxiety had brought him out there. While Nadja towed the great piece of shining metal she had brought close to where the robots worked, he thought quickly to Savary.

"Tell me. Have you noticed anything strange in the conduct of the metal men lately? It is nearly two days since you have returned to the ship and I was wondering . . . "

The Terrestrial answered in some surprise. "They have seemed oddly sluggish in their responses to the force-beam . . . I have noticed that a few times today . . . otherwise there has been nothing."

The Lyddan's voice was deeply troubled.

"I have been noticing the same thing amongst others, those working around the space-ship; so much so that before coming here I thought prudent to march them all into one of the deep pits left by meteors near the emplacement of the *Victory* and leave them stored there."

Savary stared. "But my dear Telzon! What do you fear from them? They are nothing but metal, animate only as long as we turn the ray on them."

Telzon shook a dubious head. His thoughts contained deep anxious vibrations.

"I feel that this is no longer wholly true of them. There have been waves of resistance from them for some time now. Today they seem to be more definite. You know that we are more susceptible to these immaterial vibrations than you Terrestrials are. Our senses have been subject to them for a half-million years longer. In truth, I should have noticed this earlier, I . . . "

He came to a sudden halt. A sharp scream had torn through the radio receivers of their helmets. A half-hundred yards away, dimly illumined like some nightmarish sketch by the massed and moving headlights of the working automats and her own space-suit, Nadja was struggling in the metal arms of a robot. A moment later, the other metal men had flung away their tools and were clustering around her.

Instinct overriding judgment for perhaps the first time in his life, Savary flung himself towards that frail and struggling form. Immediately . . . acting apparently in concert . . . two of the huge mechanisms flung themselves upon him and pinioned him under their enormous weight. His disintegrator spat vainly only to pour off the smooth metal of their bodies as it had done off the mysterious metal of the dead city. The thing was nightmarish! These masses of mechanized metal, mere lifeless instruments, conglomerations of joints and screws and ingots of welded matter, were suddenly animate and malevolent beings; foes that hurled themselves at the two humans like great slow-moving apes, half-mindless, yet purposeful and nearly indestructible.

Dimly, he saw a horrible vision of Nadja struggling hopelessly in enormous arms while the monster who held her seemed to shake with a brainless and loathsome mirth. The remaining metal monsters were moving in slow ungainly fashion towards Telzon, when suddenly, the little Lyddan's thought shrilled into Savary's mind.

"Think them down! They cannot have very strong minds as yet! They are only just born! Think! *Think yourself free!*"

It was their only chance! Gathering all his strength, Savary hurled the full power

of his mind against the brute; like a weapon, against the rudimentary budding brains of the robots. Under that bombardment of mental vibrations, the nascent mentality of the metal things could not stand up. Slowly . . . terribly slow for one through whose, till now, impassive blood shuddered the terror of Nadja's fate . . . the metallic arms loosened from around him. He willed them to rise, to lift their weight from his pinioned body. Suddenly he was free! Sullen but mastered, the robot giants around him had withdrawn. He stood up, aching in every limb from his desperate struggle, conscious that only his space-suit had saved him from being crushed to death under those ponderous limbs, and turned towards the place where Nadja had been writhing only a minute before in the robot's arms.

● She too was free. Telzon had hurled his own highly trained mind to the rescue. Like creatures dazed, helpless though still obscurely malevolent, the strangely animated mechanisms hovered at a distance striving feebly to war with the coercion that beat upon their rudimentary minds. They were more than ever like great menacing apes, and feeling the sweat pour from his brow under the effort of his mind, Savary grew conscious of the fact that they could not hold them there forever. Then an idea flashed across his brain. He flung it over to Telzon and to Nadja whose groping thoughts were reviving and reaching out to theirs. Uniting their minds in one common impulse of will, they beat an order on the sullen robots that made them slowly turn away and move like creatures in a dream towards the neutron-beam generator nearby. Grotesque shadows of the star-lit night, they scrambled over girder and beam and climbed heavily into the vast bowl-like mirror at the heart of the immense machine. Although the sun had sunk beneath the horizon, enough stored power remained in the reservoirs of the solar-plant beneath the concave mirrors to allow the machinery to function. As the last metal giant stepped into the mirror-bowl, Savary leaped forward and flung his weight upon the lever actuating the neutron-stream. For a bare fraction of a second, a tangled black mass seemed to be hurtling through the starlit night, borne on a darkness-cleaving arrow of shimmering blue; then the neutronic stream faded as it passed beyond the frail air of Speira. Savary switched it off. There was nothing left in the vast mirror-like bowl.

Nadja slowly tottered to her feet. "Where are they?" she asked in a whisper.

"On their way to the sun," Savary said grimly. "Are you hurt, Nadja? Have those monsters injured you?"

The girl straightened her aching limbs and spoke valiantly.

"Bruised, that is all. Telzon saved me. They were going to dash me against the girders of the machine! But what . . . how . . . did they come alive? They were metal! Metal can't live!"

Telzon answered. "Under given circumstances, it might. We have evidently seen the given circumstances. We Lyddans have always felt that even inert matter such as metal might not necessarily remain static forever. After all, there is no proof that life is the result of only one form of chemical reaction. There was, I know, a belief current in Lydda a few generations ago that the metal servants would work us harm in some abnormal way if we kept on using them. After all, they have highly organized systems with mechanical brains . . . or at least, receptive cells that allow them to respond to the directions of the force-beam . . . and a system of transmitting wires that is a fair imitation of our nervous system. We have never known what is the factor that determined the first stir of life in the protoplasms from which we sprung. Who knows that . . . with an efficient organism waiting and ready to take advantage of it . . . the same or a like factor may not have suddenly operated in the same way with the metal men? Who can say, however, what that factor can be?"

"In any case, we owe you our lives, Telzon," Savary said gravely. "It was your thought that life probably meant mind of

a sort, and inevitably mind in its most primitive inception, that saved us. I wonder if exposure to the untempered force of the cosmic rays may not have stimulated the robots' metal cells to life? We know that these rays are deadly to organic life at their full power, but on a more enduring substance like metal this law might reserve itself. Much of the life-power of the original cosmos must still be coursing through space. A mere lump of metal might only be magnetized by their currents, but complex creations, such as these robots were, needed only an impulse to energize them to life."

"Let us get back to the other ones!" Nadja cried worriedly. "What if they should escape and rebel too?"

The Power of Telepathy

● They hurried back to the ship's emplacement, though Telzon felt assured that the remaining robots could not have hoisted themselves out of the pit into which he had driven them. As the rocket-boat skimmed over the edge of the plateau that had become the *Victory's* set landing place, however, the old bird-man was betrayed into a vocal shout of horror.

"The pit!" he cried. "It is empty! They have escaped!"

Almost in the same breath, Savary spoke in a still, terrible voice.

"The ship! Nadja, the *Victory* has gone!"

They looked above their heads. Far up and quickly receding, a cylinder of metal flamed against the constellated skies.

It was Nadja this time who recovered first. While the two others were still facing the fear of imminent death from lack of air that awaited them on Speira without the space-ship, she cried out.

"Telzon! Can our thoughts reach out that far?"

Savary came sharply to full awareness. "They must!" he snapped. "Think hard with all you've got!"

In a stillness that strained and beat out against the stellar wastes, the two humans and the bird-man fixed the vibrations of their wills on that distant gleaming fleck. Would they overhaul the stolen ship? To the Terrestrials, hurling every effort of their minds across the widening gulf, it seemed an impossible hope. Even to Savary, the laws that governed the immaterial vibrations and force-waves of thought were almost unknown equations. Telzon had explained once that the emanations of the mind were as concrete a power as the vibrations of light. But could they cleave through the cosmic void at a speed sufficient to overtake the already vanished space-ship? Could they influence the brute things who, by some hazard, had found the levers that hurled her forth into space?

They sat as though turned to stone. Suddenly Nadja spoke in a whisper.

"It is returning! That spot of light is a rocket flare."

The others did not move. Slowly, the point of light that was the *Victory* broadened and grew. There was no mistaking it now. Within the minds of the three who were sending their wills out in compelling waves against the metal things which some freak of cosmic law had animated, the feeling of dominance over stumbling intellects, brains as yet clouded with the pangs of birth, rose like a tide. Nadja felt that they had projected themselves into the control-room of the distant ship and had become almost a part of the metallic monsters standing there. She could dimly feel Telzon's trained and experienced mind reach out to will each move of whatever robots were controlling the space-ship's machinery lest they crash it upon landing. Her own mind seemed part of a great, upward leaping river of power down which the space-ship seemed to slowly slip towards them. Closer and closer it came. Now it hung immediately above them with throttled rocket-tubes, and the beating of their hearts, the coursing of their blood, seemed far and slow as they poured all the reserve vitality of their beings into the immaterial struggle.

Slowly, the ship hovered, settled, came to a perfect landing on the seamed terrain. After an interval, one of its doors opened, and in compelled order, the robots

within her filed out. Slowly they walked toward the base of the vast solar-machine which Nadja and Savary had first built. One by one, they hauled themselves up its girders and into the huge mirror-bowl. Leaving Nadja and Telzon to hold them there, Savary flung himself forward and pressed down the lever that set the neutron-stream free. There was a thin flash of blue; a spear-thrust across unsentient space. Somewhere in the void above, the metal men so strangely sprung to life were hurtling towards the unimaginable furnace of the sun.

They had done their part. The apparatus for revitalizing Speira was complete.

* * *

Once more, night ruled on Speira as it had ruled for thousands of airless years. The great constellations wheeled above the unrelieved darkness of her barren soil. Sunrise was only a half-hour distant, yet no glow or brightening of the inky sky gave promise of its coming. A duskless, dawnless world, the planetoid rolled slowly on her axis towards the burning glare of the sun as she had rolled for æons. Unexpectant, dead, frozen by the indescribable cold of the spacial night; and standing by the great solar-machine that was first to receive the rays of the awaited sun, Savary, Nadja, and Telzon stood watching the jagged horizon of the desolate sphere.

One moment all was dark as only an airless world can be dark. No fine-spun atmospheric veil caught the delicate shimmer of the stars or meshed the fore-running glow of the nearing sun. Nothing but an unrelieved blackness ruled under the lidless stare of the distant constellations. Then a blinding glare leaped up between the saw-toothed peaks. Day swept out upon the turning world in a cruel, burning panoply, and Savary pressed the lever of the neutron-beam. Speira's most momentous dawn had come!

Like an arrow loosed into the heart of the sun, the palely shimmering pencil of infinitesimal matter leaped out across space. Slowly . . . at the same pace as the rotation of the asteroid . . . . the great mirror moved so as to follow the path of the mounting sun across the jet-black sky. The small mirrors above caught and held the burning power from afar like miniature stars, turning so as to always follow its source. Telzon thought a quick question at Nadja who stood beside him. Immersed in laboratory work, there was much about the great machine's construction that he had not followed. Nadja answered.

"That is simple enough; a delicate adjustment of the expansion of matter under heat. Now that the lever has once been thrown, the neutron-beam will automatically be switched off when the sun disappears, leaving the next solar-machine to take up its work, and as automatically switched on at the first sunbeam of the next day."

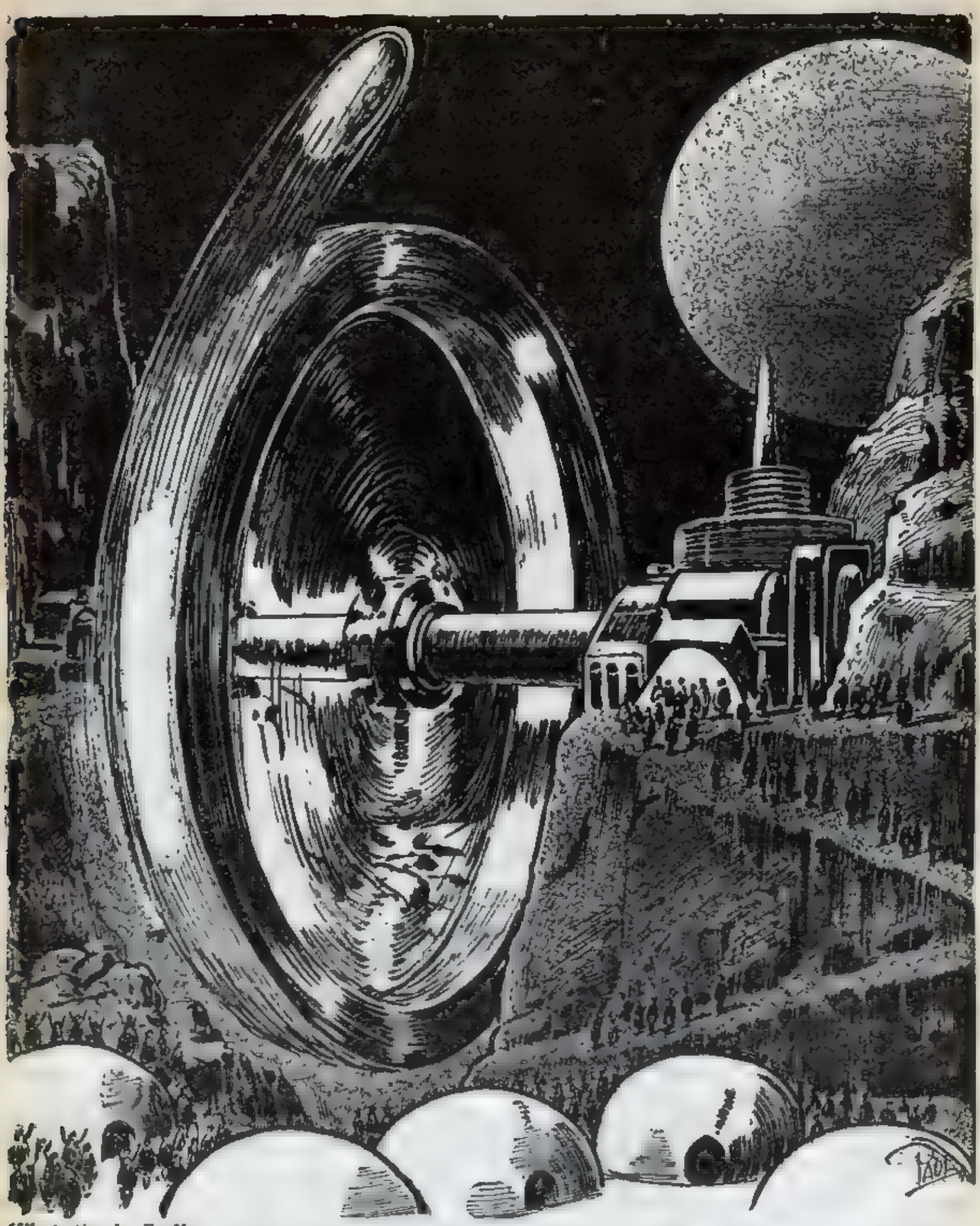
● They turned their eyes on Savary.

With one hand resting on the lever of his titanic creation, he stood facing the mounting sun. The neutron-stream had not yet reached its goal. In twenty minutes, he would know if his calculations were right. If they proved wrong . . . . if the reservoirs of solar energy should be merely tapped without being controlled . . . . they might all be standing on the edge of doom, for Speira itself might be consumed in the fierce magnetic current that would hurl itself across that strange thin bridge into its dormant core. Time passed slowly, then Savary turned abruptly around.

"We must release the other machines now," he said. "It will be dangerous to be here when the current comes across. When we come back, we shall know!"

The sun was half-way down the black sky when they returned. Slanting across the dark plateau ahead, a thin bar of brilliant flame seemed to be pouring itself into an incandescent pool of vibrating light. As the rocket-boat drew nearer, it suddenly began to rock and toss as though under the buffeting of enormous seas, and with a sudden exclamation, Savary nosed it sharply to the ground.

(Continued on page 656)



(Illustration by Paul)

Still more rapidly it revolved, and then, with a click, the metal car detached itself from the centrifuge and shot skyward at the tremendous speed imparted to it.

THE MAN FROM ARIEL

By DONALD A. WOLLHEIM

● This very short story by our new author is surprisingly absorbing for its length. Here is an interplanetary tale of a different kind—a logical one that is realistically related.

After reading this, you will wonder if all those fiery specks that shoot from the heavens and plunge into the ocean or crash into some uninhabited bit of earth are only masses of burning elements.

● It had been a hot and restless night and I slept little. Now, as the dim dawning light suffused my room with its pale glow, I was lying in bed, wide awake. Outside I could see through my open window that the mountainside was blanketed with the usual morning fog that I knew would not rise before a couple of hours had elapsed. Not feeling in the mood to arise, I just lay there and stared at the ceiling in a peaceful sort of daze.

Suddenly, I became aware of a strange sound outside. It was a whistle; very low and hardly audible, seeming to emanate from high in the heavens. It rapidly grew shriller and nearer, and then I heard a muffled crash somewhere on the slopes below. After that it became deathly still.

Wondering what had happened and believing that it probably must have been a meteor, since that was the only explanation that I could think of, I slipped out of bed and hurriedly dressed. Putting on a heavy lumberjacket, for these mountain mornings were cold, I opened the door and went out.

Outside all was grey. The thick, swirling fog hung all around. Objects twenty feet away were practically invisible. I made my way down the path and struck out through the woods towards where the crash had come. In the mist, things had a way of looming up black and terrifying before one, but as the way was familiar to me, I had no trouble. Clearing the trees, I saw before me a long, steeply sloping stretch of bare soil, covered mostly with caky dirt, strewn here and there with large boulders. This was the site of a big landslide last year, and it had not been grown upon yet. I made my way through the thick atmosphere and managed to find my way down without mishap.

About half-way down, I made out a huge boulder, looming blackly below, just at the limit of my vision. Against this rock could be seen what appeared to be the figure of a leaning man.

"Hello there!" I called out. The figure turned its head toward me and then, raising an arm slowly as if he were very weak, he beckoned to me. Thinking that he was probably injured, I hastened down to help him, and then stopped short with a gasp. For, from the figure's head, about where the eyes should have been, two darkly smouldering red spots peered out at me.

They seemed to catch me and hold me. My will vanished and I stood hypnotized. I was unable to move of my own volition. Slowly, under a will greater than my own, I walked toward him until I could see him clearly, and then stopped.

My mind reeled at what I saw. For this was no man that stood before me, but something alien. Although human of shape, having bulging jointed arms, legs, and torso, he was not flesh and blood. The entire body from head to foot was composed of a brown porous substance of the same consistency as dried mud. His face lacked a nose, mouth, and ears. There were but the two glowing eyes, beneath

which was a tympanum that probably served as both auditory and vocal organs. He seemed to be injured, for both his hands were tightly clasped over a spot on his body. Despite his efforts, a peculiar thick liquid was oozing out beneath his fingers and instantly steaming and fizzing away into the air exactly as liquid air does.

The being leaned forward and stared into my eyes. His crimson, glowing orbs seemed to expand and pulse strangely. There came to my mind a confusion of thoughts. It seemed as if I was being told a story, yet I could not make out what I was being told. My brain seemed to be undergoing a process of absorbing some sort of knowledge stored in the subconscious which I was unable to bring to my consciousness. I experienced a peculiar feeling of overwhelming and mental exhaustion which left me as suddenly as it had come.

The man sank back against the boulder as if he had completed a hard task. I heard a groan, and the light in his eyes dimmed. His head sank beneath his shoulders, and his hands unclasped and slipped to his sides. From a large gash which they had been covering, there gushed a stream of that strange fluid. A shriek issued from the creature and its legs buckled and gave way. The whole body collapsed, and dissolved before my eyes into a shapeless mass of sizzling mud. This in turn evaporated and fizzed away, finally leaving but a tiny pile of dust. At this point, I regained control of my limbs, and with a gasp of horror, turned and stumbled up the slope to my cabin.

In my dwelling, I lay down upon my bed and tried to calm my nerves. Lying there, my brain was busy attempting to bring to the fore the knowledge that had been stored there. For I was certain that something had been engraved on my mind. It seemed to be on the tip of my thoughts, but for all I was worth, I could not bring it forth.

Thinking thus, I soon became strangely drowsy, and before I knew it, I was asleep and dreaming.

The Story of V'Thardor

● I was watching a strange, unearthly scene. There was a whole crowd of men such as the one I had met. They were gathered around what looked like a huge wheel, at least fifty feet in diameter. This wheel was attached to a great mass of machinery by means of a large axle.

Hanging to the bottom of the wheel was a small egg-shaped vehicle. Set in the side of this was a circular doorway whose thick metal door was open. Before this was a being whom I instantly knew to be he whom I had met. The other people were gathering around him talking in an utterly incomprehensible tongue.

This whole scene was set in a huge clearing before what looked to be a small city of curious hemispherical buildings. The horizon of this strange world was very close. The curvature could be distinctly made out. The sky was a deep blue, and overhead, filling most of it, was a vast greenish sphere. There instantly came to my mind the knowledge that this was the planet Uranus, and that the world upon which I seemed to be was Ariel, its first moon.

But now the scene changed. A short interval of time had passed. The Arielite I had seen was inside the oval craft, and the entrance was tightly shut. There came a humming from the great engine, and the wheel began to revolve. Up swung the metal egg and around, over and down again. The wheel turned faster and the craft, on its side, moved with it. Now the crowd commenced to shout again and again as if cheering.

"V'thardor! V'thardor!"

Faster and faster turned the wheel. The attached car became only a grey blur that could not be distinguished from the rest. Still more rapidly it revolved, and then with a click, the metal car detached itself from the centrifuge and shot up skyward at the tremendous speed imparted to it. It was a realized space-ship, propelled away from the weak grip of its mother world*

* Ariel is only about 560 miles in diameter, and it did not take much of a force to counteract its gravity. This method is impossible on Earth.

by the pulling power of centrifugal force.

The view changed again. Now I was inside the space-egg with V'thardor. I watched his home sphere diminish into the distance. I saw him go to the front of the ship and stare out the window at the blackness of space in which the great gaseous mass of Uranus was rapidly approaching.

What his plans were came to me like a flash. This ship had been given enough speed to escape the gravity of Ariel and race towards the edge of Uranus. That planet's gravity would be just strong enough to catch this little world and cause it to revolve about it as a satellite. At the time when the craft was again near the first moon, V'thardor would fire the rockets in the rear, and thus breaking the gravitational grip of Uranus, would return again to Ariel.

I felt the Arielite's excitement as the ship began to swing around the huge planet. He was making observations of the big world and showed great glee at his discoveries. Evidently, I thought, Ariel had no telescopes.

And then—horror. The path which the space-egg was taking showed its true colors. It was not going to be a circle. There had been a mistake somewhere, and too much speed had been imparted to the ship. It was describing a vast parabola. Swinging part-way around Uranus, the ship had commenced to move away from the planet and to head towards the sun. It would never be able to return. All went black for an instant and then I saw another view.

It must have been a long time later, for I could see the bright disk of Jupiter far over to one side, level with the craft. V'thardor was seated at a cleared space at the control board, busy making calculations. The Arielite straightened up, and glancing at a time recorder on the wall, rushed to the rear and started the rocket motors. He waited awhile and then stopped them according to his figures. There came to me the thought that the ship had increased its speed so as to intercept the third planet in its orbit. There was a chance to make a landing.

A time passed. Now the crescent shape of the Earth was close at hand. I could make out a few outlines of land masses, although patches of cloud covered much of the illuminated portion.

The ship reversed and the rockets were set to work retarding the craft. In a few minutes, the space-egg was in the upper stratosphere, and had started to circle the earth, preparing to land.

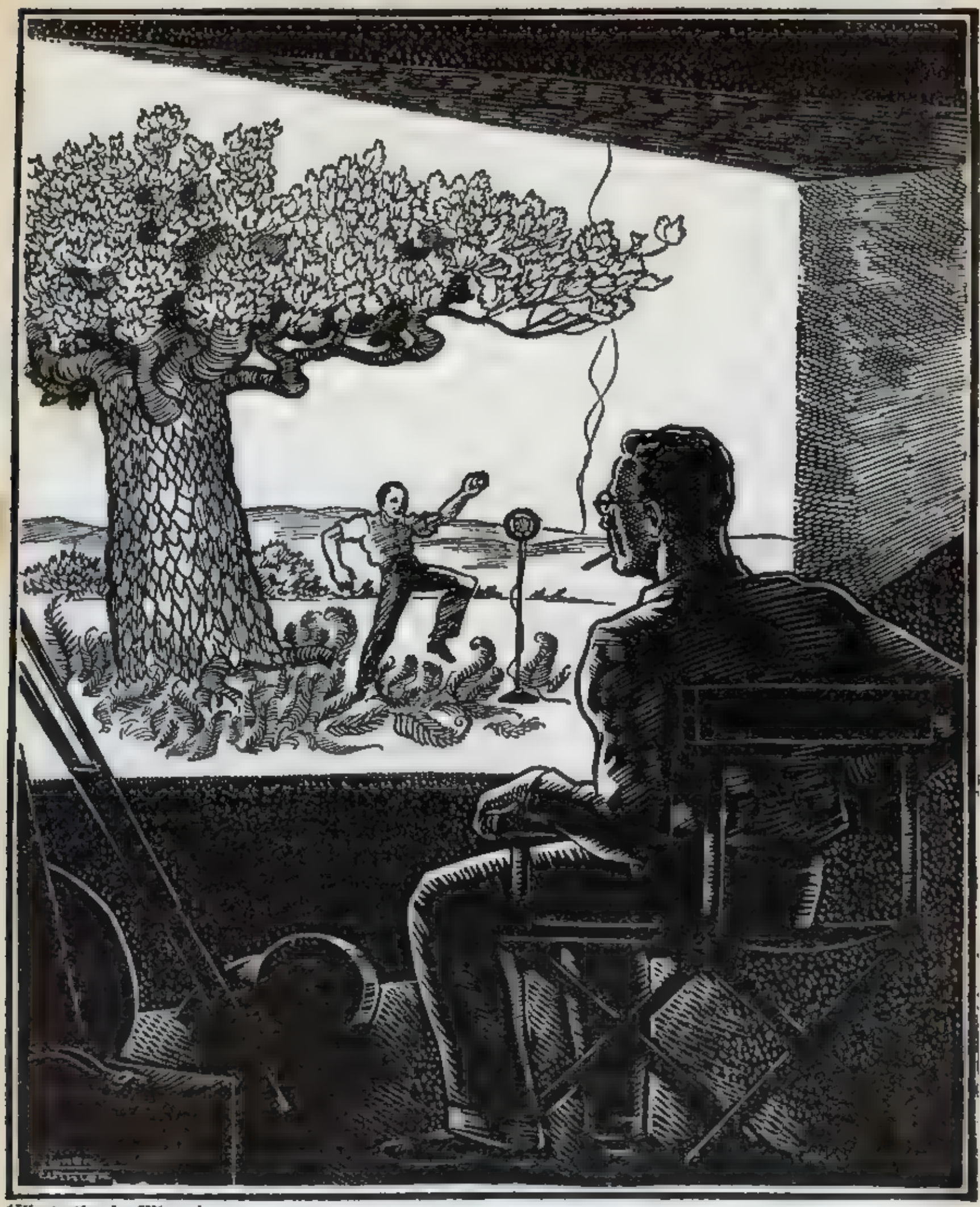
Another time interval. Now the interplanetary visitor was close to the ground. I saw that it was over the dark side, approaching the twilight zone. Then it grew lighter, and the sun shone over a mass of clouds below. Suddenly, the Arielite's ship dived. Into the clouds and through the thick fog it hurtled, and then, with a crash, hit a mountainside.

V'thardor had been hurled to the floor. I saw that a sharp piece of metal had pierced his abdomen. He held his hand over the wound, not seeming to feel pain. Then he staggered under the awful weight of his body in the terrifically increased gravity of this planet. He laboriously made his way to the door and opened it. He fell back, a look of despair on his face. The cold of the terrestrial dawn obviously felt to him like the most melting of heats. I realized that the temperature of Ariel must be many degrees below zero, and I had not remembered seeing any heating devices against the ultimate cold of space on the ship.

Bravely, V'thardor again struggled to the door and left the ship. As he stepped out, the vessel lost balance and slid down the steep incline, toppling over and over until it disappeared from sight in the mist. Struggling hard against the overwhelming force of gravity, the Arielite managed to reach a large boulder upon which he propped himself.

After a short time, V'thardor saw a man-like shape appear in the fog. He already felt greatly weakened from the loss of much life-fluid, but he still had enough will power to attract and hold the ungainly, weird-looking creature that passed for man on this world. He im-

(Continued on page 657)



(Illustration by Winter)

"Then he waved his arms wildly and appeared to be shouting in great glee."

TO-DAY'S YESTERDAY

By RICE RAY

● Here is a time-traveling story of a different calibre. This should satisfy all of our readers—those that like stories of time-travel, and those that do not—for this one is really "different."

Time has been called a stream, vibration, dimension, and many other things. In this story, we are given another explanation—a logical and very possible one—one that contains none of the flaws that are natural to stories of this type. Even the "militant anti-time-travelists" will find it very difficult to find fault with it.

Aside from the plausible and easily understood new theory presented in this tale, it contains refreshing humor—that quality that is in so few science fiction stories. We are sure you will want a sequel.

● "Quiet, please."

"Cameras running."

"Start the action."

"Scene forty-six. Take one."

The big underground scene in Criterion Film Company's great mine epic, "Hard Rock Jones," starring "Big Joe" O'Hara, hero of the caveman-worshiping film fanettes, was at last under way. This was the big scene of the picture. It packed the punch that made the Criterion name a sell-out at the box office. No reasonable expense had been spared in its making. Miles of wire formed the foundation for the large plaster tunnel that extended clear across Stage One. Scenic artists had so cleverly converted the raw plaster into the semblance of hard rock that the mule hooked to a string of ore cars was placidly awaiting the whistle signifying a change of shifts.

In the monitor booth, George Wilson was regaling the sound engineer with a colorful account of a party he had assisted in "throwing" the night before at Malibu Beach. Cavanaugh, his attention on the booth speaker, nodded occasionally from habit. Months of close companionship with George had taught him the futility of trying to impress that individual with the first commandment of the Criterion lot, "The picture comes first." Suddenly the speaker squawked like a last year's radio and went dead.

Without turning from the recorder, Cavanaugh interrupted Wilson's historic narrative with, "If it's not too much trouble, George, would you mind getting off Miss Garbo's lap and going out to see what is wrong with Number One 'mike'?"

"O. K., bookworm," retorted Wilson. "If you'd lay off Einstein and step out once in a while yourself, you'd be half human." And the door of the booth slammed behind him.

Cavanaugh shrugged his shoulders. After all, George was several years his junior, and despite his breezy exterior, had a keen mind that was quick to grasp. That, plus his winning manner, was what first attracted the sound engineer to the extent of inviting the boy to share his bachelor apartment shortly after Wilson had first appeared on the lot several months before. Strong friendship had sprung up between the two, as occurs so often among persons of diametrically opposite natures; but one thing they did have in common, and that was an unrestrained love of scientific research. Cavanaugh's musings were rudely interrupted as Wilson nearly tore the door off its hinges.

"Say, Chief, some lousy ham has copped the 'mike'."

"What?"

"Nothing else. Clipped the cable and went South with it."

"But who—?"

"Do you think I'm Sherlock Holmes? Of course, my dear Watson, he limped slightly on his left hind foot and had a mole on his right ear. But no foolin', Earl, it's clean gone. Come and see."

The two hurried out to the set, and there, where the microphone had stood, nothing remained but the end of the rubber-covered cable that had connected it with the sound booth. Earl picked it up and examined it.

"Wait a minute! This cable wasn't clipped. Notice how the wires are fused and the insulation is scorched."

"So what, Mr. Hawkshaw?"

"Naturally, a short circuit," and Cavanaugh stooped over and began searching about at the spot from which he had picked up the cable end. "Here, see this! This wire is burned," pointing to a place on the set, down close to the stage where part of the wire forming the tunnel set was bare of plaster. "Nothing could be simpler; the insulation became scraped off and the cable grounded on the set and burned in two."

"Marvelous!" cried George, "Chief, you are uncanny. But, though I hate to mention it, where is the 'mike'?"

There was no denying that it was gone. The stage was ransacked; the dressing-rooms searched. Property men, second assistant directors, even the lordly assistant himself, scurried frantically around the studio, searching, but to no avail. Meanwhile, the director strode up and down in front of the camera, mentally tearing at his hair, or rather at the place where there once was hair. Was a production of the great W. Mervin Hotchkiss to be held up because some mentally incompetent sound-man had misplaced some equipment? Why didn't some one do something? Get another "mike." Get two, six, a dozen. The picture must go on. It went. Another microphone was substituted, and the scene proceeded immediately.

A further search that evening, this time a very thorough one, only tended to deepen the mystery, and Earl was finally forced to accept George's theory that one of the extras, noticing the short and the cable burned completely through, had seized the opportunity to make off with the valuable piece of apparatus. Though how he had gotten by the eagle eye of the gateman was something else again.

● The following morning produced nothing new, nor did the day, and that evening found the two sound-men in the projection room viewing the shots taken the previous day. Earl was in close consultation with the film cutter, discussing the synchronization of some wild sound track he had recorded of various sound effects, while George was checking the scenes being projected on the screen for tone quality, as it was his duty to re-record those which might be improved by better "mixing." Finally, the great tunnel scene flashed on the screen. It was perfect. The cameraman had caught the lighting just right. Details in the foreground stood out plainly, while the cavernous maw of the tunnel stretched away into seemingly endless, gloomy obscurity, lighted here and there by the flares of the miners, like fireflies in the fastness of some deep, miasmatic swamp. Even George, blasé as he was, due to long familiarity with pictures, was thrilled. Suddenly, the beauty of the scene was shattered by a terrific blast from the speaker, followed by a thin, wailing, crescendo shriek. The screen went blank, then the scene picked up again and proceeded in normal fashion.

"What the devil was that?" asked Cavanaugh, startled.

"Must have been that shorted shot, Chief," replied George, casually.

"Quite likely," responded Earl, "but that wailing sound that followed was new to me. I've never recorded anything like that before. Clyde!" he called to the operator, "let me see that reel as soon as you've run it off."

"All right," the operator answered,

"she's about run out now. Shall I rewind first?"

"Please."

"What's the idea, Earl?" questioned George.

"I want to look at that sound track. That's the most peculiar sound I've ever recorded." Cavanaugh spoke with some authority, for he was well grounded in his science, having been a pioneer in the field with one of the largest electrical companies from the earliest experiments in sound recording.

The sound track is a narrow margin on the left side of a motion picture film, upon which sound waves are photographed in various ways. The photophone system, which was the one used by Criterion, is a variable area system. That is, the track is exposed to a bright light reflected upon it by a small mirror in the recorder. This mirror is mounted on a sensitive coil in a magnetic field. When the sound waves strike the delicate "ear" of the microphone, they are changed to electric impulses which agitate the mirror, causing it to throw the reflected light beam on and off the sound track, resulting, when the film is developed, in the wavy, saw-toothed line so familiar in flow-meters, seismographs and other recording apparatus. In projecting, the process is merely reversed; the light beam from the projector, passing through the sound track on the film, falls upon a photo-electric coil cell, where it is converted back into electrical impulses which actuate the speaker as in any radio. If the motion picture camera and the sound recorder are properly synchronized, recorded speech and photographed lip motions are simultaneous.

When Earl and George had arrived back in the sound booth, Earl began examining the film for the short-circuited scene. George fell to meditating, doubtless planning depredations upon the hearts of some fair film beauties, for he was ever improvident with his affections.

"Here it is," said Cavanaugh, "By Jove! What's this? George, hand me that glass." He seized the powerful reading glass that Wilson handed him, and studied the film avidly. "George! In the name of all that's Scandinavian, look at this."

George leaned over and looked through the glass. He raised his head and stared at Earl in dumb amazement. There on the film in place of the usual wavy, saw-toothed line, was a narrow strip of a most peculiar-looking landscape, and there in the foreground stood the missing microphone.

"Some wise guy trying to show us a good time," suggested Wilson, when he had recovered from his first surprise.

"No, it can't be that," answered Cavanaugh thoughtfully. "We had that film in our possession until it went to the laboratory, and they couldn't have tampered with it, as this shot is in the middle of the reel and shows no sign of splicing."

Once more he bent over the table and studied the sound track. Low hills formed the background of a verdant valley. Vegetation, while profuse, was coarse and low-growing. "George, did you ever see such peculiar-looking trees? Notice that one right behind the 'mike'."

Wilson took the glass and examined the tree in question. Lacy, fern-like fronds extended along the ground from a somewhat slender base, as though to protect a shallow root system. The trunk itself was covered with sheath-like leaves that grew downward, giving it a rather shaggy appearance. As the trunk rose, it increased in girth until it terminated about twelve feet from the ground in an enormous crown of tight-grown foliage.

"Looks like a cross between a Brahma hen and a cabbage," was George's contribution. "Earl, I think there is more here than appears on the surface."

"Well, we have eliminated the possibility of anyone trying to rob us, and also that of a mix-up in the laboratory. In fact, I am almost ready to doubt the whole thing."

Beyond the Time-Wave

● But there on the table that strip of man-made celluloid lay accusingly, aggressively, perhaps even threateningly, a baffling, mysterious fact triumphant over doubt and unbelief.

George eyed it askance. "Come on, Earl, let's go home and put on the feed bag. If I stick around that thing much longer on an empty stomach I'll have the heebie-jeebies."

The two lived in a modest apartment in a private home close to the studio. Their landlady, Mrs. Harris, had formerly been a screen player of some note herself, but with the public demand for new names and faces, she had found herself a straggler in the march to fame. With a wise philosophy, she had accepted the dictate of time and retired quietly with her savings, to view with some amusement her successors in their constant struggle for stellar renown. Occasionally, she received a call to play a mother rôle, a part for which she was well fitted.

Being widowed for several years and feeling quite alone in her rather roomy house, Mrs. Harris had finally yielded to Earl's importunities to let him occupy a suite of rooms on the second floor, partially refitting one of them for a laboratory. When Earl brought George home, the latter won his way into her affections so quickly, that, inside of a week, she was worrying herself half sick over his minor scrapes and escapades.

.The arrangement included breakfast, but as the two worked very irregular hours at the studio, they ate their other meals when and where they could. George's claims of proficiency in the culinary art were soon established, to Earl's mingled surprise and satisfaction. So bachelor suppers were in order as often as work and George's "public" permitted.

This evening, the meal was no exception, and Earl felt his depressed mental condition lifting, so that, after pushing back his plate with a sigh of satisfaction, he was able to consider the whole matter in quite a dispassionate manner. The latest song hit, whistled slightly off key in the kitchen, told him that George's threatened "heebie-jeebies" were of a temporary nature. Smiling to himself at a particularly sour note, he wandered into the laboratory.

There George found him some time later. The strip of sound track lay upon the desk before him. It seemed to gloat sardonically, ominously up at him.

"That's the old spirit! Always a glutton for punishment. Why didn't you toss that thing in the incinerator?" asked George, glowering at the film.

"But it interests me. It couldn't just happen. There must be a reason for it and I mean to solve it," answered Cavanaugh.

"O. K., Boss, how do we start?"

"Thinking might help, if it isn't asking too much," replied Cavanaugh smiling. "However, since we have eliminated outside influences, let's start with our equipment. We know that the recorder is all right, because we had nothing wrong with our succeeding 'takes.'"

"I know that the cables were all O. K.," said George.

"Particularly the one that shorted on the set!"

"Aw, why bring that up."

Each fell to pondering over the problem in his own way. Finally, Wilson remarked casually, "Aside from your lousy sound track, Earl, what effect do you suppose the 'juice' would have on the set? As I remember it, that foundation wire was all wound in one continuous spiral through the whole tunnel. Boy! What a radio coil that is. Ought to be able to get the whole universe on that."

Earl started, then gazed at him agape. "'Out of the mouths of babes,'" he quoted. "George, you've hit something, and not a milk wagon this time."

"Aw, I didn't hurt your old flivver, anyhow," replied George flushing.

"Oh, forget about the car. Quick, hand me that 'Radio Physics,'" demanded Cavanaugh.

George handed him the book. "What's up? Have you struck something?"

"I don't know. Run away, little boy. Go take Marlene Dietrich to a movie or something. Don't bother me," and Earl grabbed a pencil and started jotting down figures as he feverishly turned the pages of the book.

George, chastened, strolled idly about

the room, picked up his ukulele, strummed a few chords but, at a frown from Earl, desisted, and finally settled himself in an easy chair with a book, where he alternately read and dozed. After several hours, George was suddenly startled into wakefulness by a cry from Earl.

"Time! By Jove, that's what it is. Time! Why has no one ever thought of it before? It couldn't be anything else but Time."

"You sound like the announcer at a prize fight or a radio program," responded George.

● Earl smiled. "Come draw up a chair and learn something," he said. "You see this chart. These little wavy lines upon it represent rays or waves of energy. Now, beginning on the right, you will notice they are very short and close together. Those are the cosmic rays and from them we progress through the range of the gamma rays into those of light, then successively to the heat rays, X-rays, radio waves and finally into the unexplored region of long waves beyond those of the radio."

"How wonderful, teacher dear, and if all you say is true, they should award you a seat in some nice large kindergarten, teaching the kiddies their a b c's."

"I realize all this is quite elementary, George, but I want to expound my theory in some sort of logical sequence. Heretofore, man's mental conception of Time has been that of a smooth stream, flowing ever forward, while he watches the passing scenery like a frog on a piece of driftwood. Were it possible for him to supply the driftwood with necessary power, he might travel upstream into the past and re-observe the sights already passed, or downstream into the future."

"And to what does all this lead, learned sir?"

"Simply this. Time does not move in a constant stream, but rather in a series of waves. Long waves. Part of those waves in the unexplored region beyond radio."

"Vas you dere, Sharlie?"

"I know it sounds unbelievable at first, but let's go into it deeper. I have plotted a time curve, and strangely, it resembles the Hurter and Driffield light curve. You know that in the latter, only a portion of it is available for photography. First comes a region of under-exposure, succeeded by a region of correct exposure, and finally by one of over-exposure. Now, my calculations show that, other than on the peak or crest of a time wave, time is so distorted that an existence is impossible. We are traveling along on one of these wave-crests much like a cork floating on a breaker carried forward by its momentum. Other existences may follow or precede ours on their own respective wave-crests, much as a train of cars traveling at the same rate of speed through the same position in space, yet each one a separate entity. Suppose we are passengers on that train, and at the time are passing through a tunnel. We are in the coach but by stepping across the vestibule, we enter the sleeper; our surroundings are different; we pass on into the diner; again a new environment; but we are still going through the same tunnel. The vestibule between the cars represents the trough between the time waves, and as time is so distorted in those troughs, it destroys the continuity or connection as far as our conception goes.

"Now when the cable became grounded on the set, the miles of wire in it became charged, formed an immense radio frequency coil of thousands of turns. The microphone, being within its influence and being charged itself, automatically moved into the existence of the time wave to which the coil was tuned; whether ahead or behind our own, I don't know, nor does it make any difference. Though occupying the same place in space as it was before, it is beyond our reach, for it is off our wave-length."

"But wait a minute, Earl, how can a thing occupy a place in space and yet not be there? You will be telling me that two objects can occupy the same space at the same time, in a minute."

"And so they can, always providing

that they're on different time waves. Don't you see, George, if you are listening to a radio program, you are conscious of only the one to which you are tuned, although there may be thousands of others on the air at the same time? To change your program, you merely tune to a longer or shorter wave length, but the original program is still there, even though it is then out of your reach."

"You mean that it might be possible to reach that 'mike' in this 'other existence' of yours?"

"Yes, I think it might be quite possible should one try, but I don't think I would care to make the experiment," replied Cavanaugh, laughing.

"I must say that you are calm enough about it," said George, half angrily. "Here you reach into a mathematical hat and pull out a scientific rabbit and announce placidly that, 'The thing may have possibilities, but what of it?' Good God, man, don't you realize that if you can prove your theory, you are greater than Einstein or Jeans or the rest of those philosophic Johnys? By tomorrow you'll be the talk of the world. Why, even Millikan would be willing to give his right eye for half your front page space."

"Ah! But, my fiery young orator, you are forgetting one essential: the proof. Don't think that the immensity of the thing is lost on me or that the possibility of becoming a world topic leaves me unmoved. But I must have complete proof before I pull the rabbit out of the hat, as you put it; at least, there must be many rehearsals before I try it on an audience. Please don't mention it to anyone until we are far better grounded in it than now. And now to return to the prosaic, we still have to be at work in the morning, and I think a little sleep is in order."

But sleep did not come readily to George's excited mind. He tossed and turned. Every thought opened fresh avenues of speculation. On the other hand, Earl, mentally exhausted from long concentration and difficult calculation, soon succumbed to the maze of dancing numerals that whirled through his tired brain.

Upon awakening, Earl felt much refreshed. George, quite contrary to custom, was already up and gone. Evidently unable to sleep, he had gotten up early and gone down to tease Mrs. Harris for some special delicacy for breakfast, which would undoubtedly be forthcoming.

Earl took a shower, dressed leisurely, and descended to the dining-room, where Mrs. Harris met him with her usual bright smile.

"Good morning, Earl. Right on time as usual," she said kindly. "I suppose that scamp of a George won't be down till these muffins are all cold."

"Why? Isn't he here?" asked Earl in some surprise. "He was up and dressed before I awakened. Perhaps he is outside. I'll call him."

He returned shortly, looking somewhat puzzled. "I can't locate him anywhere," he said. "I wonder if he has gone to work?"

"Wait a moment," said Mrs. Harris, and she hurried out to the kitchen. She returned almost immediately. "It's all right, Earl," she assured him. "He's gone, all right, and so is half of a fried chicken and all my shortcake—the rascal."

● Upon arriving at the studio, Earl made inquiry about George, but no one had seen him. As he was passing through the stage, he noticed a cable stretching across the floor. Now, one of George's duties was to roll up all cables at night before leaving, and Earl had never been known to be remiss with any of the equipment in his charge. Earl was puzzled. He followed the cable. It was connected to the foundation wire of the set, but this time with a coil in series to prevent a short circuit. Madly he turned and dashed to the sound booth, a half-formed suspicion growing in his mind. Yes, just as he had suspected, the light was on and the recorder was in operation—but the film had long since run out.

His hands shook as he removed the film, and he mentally cursed himself for his careless words of the night before. Wretchedly, but with haste, he rushed the

film to the portable laboratory that he used on locations. He fumed and swore at the length of time it took to develop the reel. As soon as he dared, he grabbed it from the solution and studied it feverishly. But to no purpose; the sound track was too narrow for him to make much of the reversed shadows on the negative. It must be dried and a positive made from it. More delay. After seeming hours, which were really minutes, it was done. With anxious dread, he carried it to the projection room. What would that fateful celluloid show?

Tremblingly, he watched as the narrow track appeared on the screen. Yes, there was the same strange landscape with the enormous tree-cabbage in the foreground and the microphone at its foot. Nothing had changed. All was as before. But wait—what was that hazy appearance upon the ground by the microphone stand? Steadily its density increased. It was taking definite form. Yes, it was a human body, but how distorted and agonized it looked! The limbs were all drawn up and the hands were clutching and rigid. The face could not be seen, as the upper portion of the body was off the sound track. But the clothing! Earl would know that suit anywhere. It was George. Poor, foolish, adventurous George, a martyr to a half-baked theory. George of the happy smile and winning manner, nothing but a silent shadow on a silver screen.

But hold—that hand moved! Yes, yes, it was relaxing. See, the arm was moving! Slowly George raised himself to a sitting position. His face was expressionless, trance-like. Then a look of bewilderment appeared. Slowly that gave way to dawning comprehension. He rose to his feet and looked about. Then he waved his arms wildly and appeared to be shouting in great glee. Finally, after a few dance capers, he stooped and picked an object from the ground. It was a camera slate. He had evidently taken it with him. Seizing a piece of chalk from his pocket, he started writing rapidly. Then, carefully placing himself directly in front of the microphone, he held up the plate before him.

"Hold it, Clyde!" called Earl, "that's enough. Just let me have that film."

"O. K., Earl," responded the operator. "What is it, anyhow?"

"Oh! Just another experiment of mine gone wrong," answered Earl, despondently, as he took the film can.

"Too bad, old man," said Clyde, noting his white face and shaking hands. "Don't let it get you down."

"Who cares?" replied Cavanaugh.

"All sound-men are nuts anyway," muttered the projectionist to himself as he watched Earl hurry off to the sound booth, the can of film clutched tightly under his arm.

The World of To-day's Yesterday

● Earl seized the high-powered glass and ran rapidly through the film with practiced fingers. What would be George's message? His first message from beyond! Beyond what? Beyond where? Wasn't George practically here, near him? Yet the impenetrable veil of a different time frequency separated them as completely as light years of space. Then from whence was George sending the message? From yesterday? But yesterday had gone. Yet George was here even though he had stepped back into yesterday. Yes—that was it! A message from that yesterday still existing. Today's yesterday.

"Having a wonderful time. Wish you were here." The solemnity of the occasion of the first communication across the void of time meant little to the irrepressible George. "Boy! What a headache," the message continued. "Wouldn't advise trip for children under eighteen or fat men with weak tummies.

"Goofy looking place," he next wrote. "So far no reception committee or ticker tape. Some one is holding out on me."

Rapidly, as Earl ran through the film, it was still too slow for him. Unable to curb his impatience, he replaced the reel in the can and hurried to the cutting room. Finding it unoccupied, he locked the door and threaded the film through the small projector kept there for the convenience of the film cutter.

On the screen, he saw George lay down the slate and gaze about him interestedly, then turn and walk over to the microphone. As he approached, the tree became suddenly violently agitated, the downward growing leaves on the trunk bristling up like the hackles on the neck of a fighting cock. George, momentarily startled, drew back, then seized the slate and wrote rapidly.

"Did you see that damned thing? It stuck out its claws at me like a cat. There is a thorn four inches long under every one of those leaves that comes out like a jack-in-the-box when the leaf rises. Nice pleasant companion for a dark night." He consulted his watch. "At the stroke of the gong it will be exactly 7:35, New Hollywood Standard Time," he wrote. "We will be back on the air again at six p.m. with a bedtime story for the kiddies. Meantime, I'm off to hunt dragons or maybe fair damsels in distress," and with an airy wave of the hand, he was gone.

Earl sat long in a brown study, the clicking of the projector as the reel ran out at last rousing him to the present. Regardless of his glimpse into another world, his own was going prosaically on its way.

The day passed slowly, Cavanaugh going through his routine duties more or less like an automaton. He explained George's absence vaguely as a business engagement. But promptly at six he was again in the sound booth and had the recorder running. Not satisfied with one reel, he ran a second and hurried to the portable laboratory, only to find he had insufficient developer. There was nothing he could do but send the sound track through to the outside laboratory with the regular film. That meant that he could not run it before the following day. Deeply disappointed, he locked up and went wearily home.

Mrs. Harris met him at the door, and noticing that he was alone and sensing something from his manner, inquired anxiously after George. Cavanaugh, relieved at last to find someone whom he could take into his entire confidence, poured out the whole story. Mrs. Harris sat as one stupefied with amazement.

"Now, isn't that just like George?" she said finally. "To run off like that without a word to anyone or without even packing a bag. I'll get some of his things together and you must mail them to him in the morning."

Earl gave up. He had expected incredulity. But complete lack of comprehension—well, possibly not so strange after all. He, himself, found it hard to understand.

The next morning found Cavanaugh at the studio early. He pestered the laboratory by telephone until they made a special trip with the Criterion films. Once more locking himself in the cutting room, he started the projector. Again the narrow strip of landscape was on the screen, but nothing was to be seen of George. The reel wound on. Still nothing but that strip of quiet valley. The reel ended. What was the matter? Could there be such a divergence between his watch and George's that George had already come and gone again? The thought startled him. It was as if he had been gripped by an icy hand. If George had done so, how was he, himself, to know at what future time he would receive communications? He could not approach the production manager with a proposal to have exclusive use of the recorder for twenty-four hours a day; and who would believe him if he told his true reasons?

Hastily, with shaking hands, he put on the other reel. The same quiet, lifeless scene. How he hated it. The same tree and bushes, the microphone standing mute in the same spot on the sound track and —George, blithe, but somewhat disheveled, stepped in front of it. He wrote upon the slate and held it up.

"What ho! old ant-eater. Sorry I'm late, but I just met the most interesting young lady rhinoceros. At least, I think that's what she was, although she had a tail like an alligator—probably borrowed plumage. But, boy, was she beautiful! Such form, such grace. And did she fall. I almost had her phone number, when Papa Rhino, evidently resenting my attentions, chased me into the river. I'll bet

he is some wealthy jungle politician and she's his only child.

"Man, man, what scenery. Old Hotchkiss would go completely nuts over this location and produce three 'Trader Horns' simultaneously. I've seen every animal in the menagerie except a camel. Not a hump in a jungleful. And would I walk a mile for a fag! Can't you send me some by the Tunnel Express? You might add a ham sandwich to that order, too. Just coil them up in a wire and hook the cable onto the set as I left it. I'm pretty tired and wet, Earl. And unaccustomed as I am to public bathing, I'm going to dry my clothes and get some sleep. See you in the morning at eight o'clock. Don't miss me." And he walked away.

● Earl glanced at his watch. It was ten minutes to nine. George had already sent his message: a message that would never leave the strange land in which he was now isolated. The delay in receiving the film had been a costly one. The line of communication was broken. George would go on and on sending messages, with secure faith in him, while he had failed. He had let poor old George down. George had always depended on him, and now—wait! That very dependence held a gleam of hope. Wasn't George always hard to get out of bed in the morning, and wasn't he constantly threatening not to call him a third time, yet just as constantly doing so?

Cavanaugh dashed to the sound booth, put a full can of film on the recorder. Leaving it running, he ran out to a nearby café, where he procured sandwiches, a carton of cigarettes, and several boxes of matches. Hurrying back to the studio, he prepared the package according to George's instructions. At least, George would get them even if Earl couldn't communicate with him.

"Wait a moment! What a dumb-bell I am," cried Earl suddenly. "Why, of course." If George could receive objects, why not a note? Laughing aloud in his relief, he ran in and shut off the recorder. Writing a hurried note explaining the delay and setting a time for a future message, he tucked it into the package, fastened the coil to the set, and ran back to the sound booth to restart the recorder. When the reel was finished, he went out again to the set. The package was gone. Two-way communication had been established.

Almost blithely, Earl strode, some time later, from the laboratory to the cutting room. The cutter was there.

"May I use your projector a bit?" asked Earl.

"Sure. Help yourself," answered the cutter. "I was just going out. Old Hotchkiss wants to see me in his office about a couple of retakes."

Earl was pleased at this, although in the relief of the moment, he did not care a great deal who saw the sound track. The cutter was usually much too busy to pay any attention, anyway.

● He started the projector. There it was—landscape, tree and all, but—at the foot of the tree lay the shattered, twisted remains of the microphone as though some giant hand had seized, crushed and cast it down. Against its broken standard lay a fragment of the camera slate.

Upon it were the words, "—much closer now. I can't—" Nothing more.

THE END

TRAVEL OF THE FUTURE

● WHAT will the vehicle of the future look like? New and radically different types of cars and aircraft will be in use. Will the rocket be successfully developed within the next few years? There is a field for the adventurous, as well as the scientifically minded, in the work. Information on this subject will be found in the January issue of

Everyday Science and Mechanics

NOW ON ALL NEWSSTANDS

(Illustration by Paul)

Rajah struggled to break the hold of her antagonist. But her efforts were in vain . . . . Lugi had made good his escape.

WHEN REPTILES RULED

By DUANE N. CARROLL

● It is a proven scientific fact, as everyone knows, that millions of years ago, in the Mesozoic Era, huge dinosaurs, tyrannosaurs, pterodactyls, and other pre-historic monsters ruled the earth.

Just recently, in the Chicago World's Fair, there were constructed replicas of these creatures, modeled into a scientific perfection of what they must have appeared like when they were alive.

Here is a page from the Book of the Ages—a tale of a typical day during the Mesozoic. For a short while, you will be taken back to the dead past—the unrecorded past of the days before man appeared upon the earth.

● The sun—a dull, fiery red orb—was just rising over the far distant hills, and though its rays seemed struggling to penetrate the atmosphere, which was constantly laden with volcanic dust, they brought light to a land of beauty.

It was not a land in which man lived. In fact, had man existed, it is doubtful if he could have long endured, for this was the Mesozoic—an age of giant reptiles—and the fierce creatures ruled supreme, not only on land, but in the air and sea as well.

As the pale rays from the sun found their way through the fronds of branches of tall, palm-like trees, and played on the thickets of conifers, cycads and other vegetation, these great saurians began to awaken. Those that were carnivorous straightway began to stalk smaller creatures on which to make their morning meal, while the herbivora plodded their slow, ponderous way toward near-by marshes to browse, or mowed down sheaves of cycads and conifers, in order to procure the more succulent leaves near the tops.

From time to time, as the morning advanced, pairs of these huge monsters would meet in deadly combat, and the forest fairly rang with their fierce screams and rumbling bellows, and strange birds would flock into the air, adding their startled cries to the bedlam.

In this land lived Lugi, the Struthiomimus. Here was one reptile that was far from fierce. In general appearance, he resembled an ostrich with a long tail, but his body was covered with scales. His jaws were toothless, and the long, slender fingers and short, puny forelegs were not at all adapted for tearing.

As the sun's first rays flickered among the leaves and vines of the thicket where he had spent the night, Lugi stepped into the open. He was hungry, but he knew where he could find food. There was considerable risk, but it was the kind of food that he liked best, and after all, since he had first hatched from his egg warmed by the tropical sun where it had been buried in the loose sand, he had learned that everything he did was accompanied by dangers, and had come to accept them as part of his existence.

After pausing an instant, in which he listened intently for any signs of danger, he began to make his way along one of the smaller trails. He walked erect on long, slender hind legs which could carry him swiftly away from all but the quickest of pursuers. But still, he was cautious and concealed his body as much as possible by selecting paths which led through the densest foliage.

He soon reached a spot where the trees gave way to an area of gently rising ground. The soil was loose and sandy, with only an occasional thicket, but it was strewn with rocks and boulders.

The moisture-laden air had grown dull

and heavy, and the blazing rays of the sun, beating intensely on this stretch of comparatively open ground, caused steam to rise faintly from the damp earth and foliage.

But Lugi had no eyes for these manifestations. He had paused, just within the outermost boundary of trees, and was scanning the sky and space ahead for signs of danger. After waiting a considerable length of time, in which he apparently satisfied his cautious brain that all was well, he stepped into the open and raced straight up the hill.

For perhaps three hundred yards, he ran, and then suddenly halted. Here was a small space nearly surrounded by thick growths of vegetation. It was so located that it received the full benefit of the sun for the greater portion of the day. A keen observer might have noted that the soil near the center had been disturbed. Lugi had been here before, and though he had tried to erase the evidence of this previous visit, he had not been entirely successful.

● After taking one last look in which he scanned the sky and landscape in all directions, he leaped over the tangled vegetation, and went straight to the spot where the soil had been disturbed. Stooping low, to bring his forepaws near the ground, he began to dig in the loose sand. Shortly, five large eggs were brought to view. They had been laid and buried in the sandy soil by some large saurian, and left to be hatched by the warm rays of the sun.

That the eggs were not left entirely unguarded, was evident by Lugi's hurried and nervous actions. Since leaving the forest, he had hurried, seeming to throw the greater part of caution to the winds. Quick, frequent glances had been cast above, as though he had momentarily expected some danger from that source, but he had not faltered. He seemed determined, now that he had started this dangerous venture, to see it through, if possible.

Quickly, but carefully, taking one egg from the nest, he laid it on the ground near by and then reburied the remaining four. Nervously he scraped and patted the soil until as much evidence of his visit as possible was removed. Then wrapping his long, slender fingers about the egg which he had selected, he turned to leave the dangerous place at once.

But he was not to escape undetected. From out the sky, but at a distance, came a shrill, piercing scream, and a huge bat-like creature could be seen flying straight and swiftly in his direction. What a fierce creature it was! Its size and ferocious appearance would strike terror to a heart far more courageous than Lugi's. Its great wings spread at least twenty feet from tip to tip and the long triangular-shaped head and powerful jaws were stretched as far forward as possible, impatient to snap up their prey. The fierce screams were continuous now, and when the long jaws opened, rows of cruel, sharp teeth were exposed, which could easily make short work of the smaller reptile.

A Primeval Battle

● Lugi did not hesitate for an instant. He knew what manner of creature was attacking him. It was Rayah the Pterodactyl, giant saurian of the air and owner of the nest he had just robbed. Yesterday, Lugi had been skulking among the outermost fringe of trees, which bordered the clearing, and had chanced to pass at the very instant when Rayah left her nest. He realized that here were eggs—his favorite food—and so waited until he was reasonably sure that the air saurian would not return for some time. Then he had stolen one of the eggs. He had intended to steal them all eventually, but apparently Rayah had discovered the theft and was watching her nest more closely than usual. Regardless of how, he was discovered and was in a dangerous position.

Even as he glanced towards the source of the dreadful screams, Lugi's nimble legs were in action, carrying him swiftly towards the protecting shelter of the trees. If he could but reach them! he would be temporarily safe at least, and have an opportunity to lose himself amongst the thick growths of vegetation, for Rayah

could not begin to spread her great wings among the trees.

Faster, and still faster ran Lugi. In the presence of this great danger, his terror knew no bounds. In many places, he did not even swerve aside to avoid the thickets and rocks, but leaped nimbly over them with far more ease than could a modern deer. But in spite of his nimble legs, he could not match the speed of Rayah's great wings.

Gradually the fierce air saurian drew closer to her prospective victim. It was now possible to hear the long-drawn hiss which terminated each scream. Lugi's eyes were intent on the trees ahead. They were very close now. If he could only reach them, there would be temporary respite, at least. Now Rayah was directly above him. She was preparing to swoop down upon him. Down she came like a plummet, cruel talons outstretched to grasp, and powerful jaws open, from which a hiss like escaping steam trailed into the air.

As though sensing the nearness of his peril, and driven by terror, Lugi brought into play every ounce of energy that remained in his agile body. The trees were but a few paces ahead, and with a cry like that of a stricken rabbit, he threw himself towards them. This new burst of energy increased his speed and destroyed Rayah's aim. She missed him with her talons, but in swerving to avoid crashing to the ground, the tip of one wing grazed Lugi's body, bowling him over. More frightened than injured, he was quickly on his feet and safely among the trees, but still he did not pause. He knew that Rayah would follow overhead, watching his every move, and if he could not elude her soon, her screams of rage would attract some larger and perhaps fiercer reptile to the scene.

Then began a grim game of hide and seek. Rayah sailed above, her great wings just skimming the tree-tops, and her eyes, blazing with anger, following every move that Lugi made. He, in turn, ran in and out amongst the thickets, trying to outwit his fierce pursuer before another of his enemies was attracted to the scene.

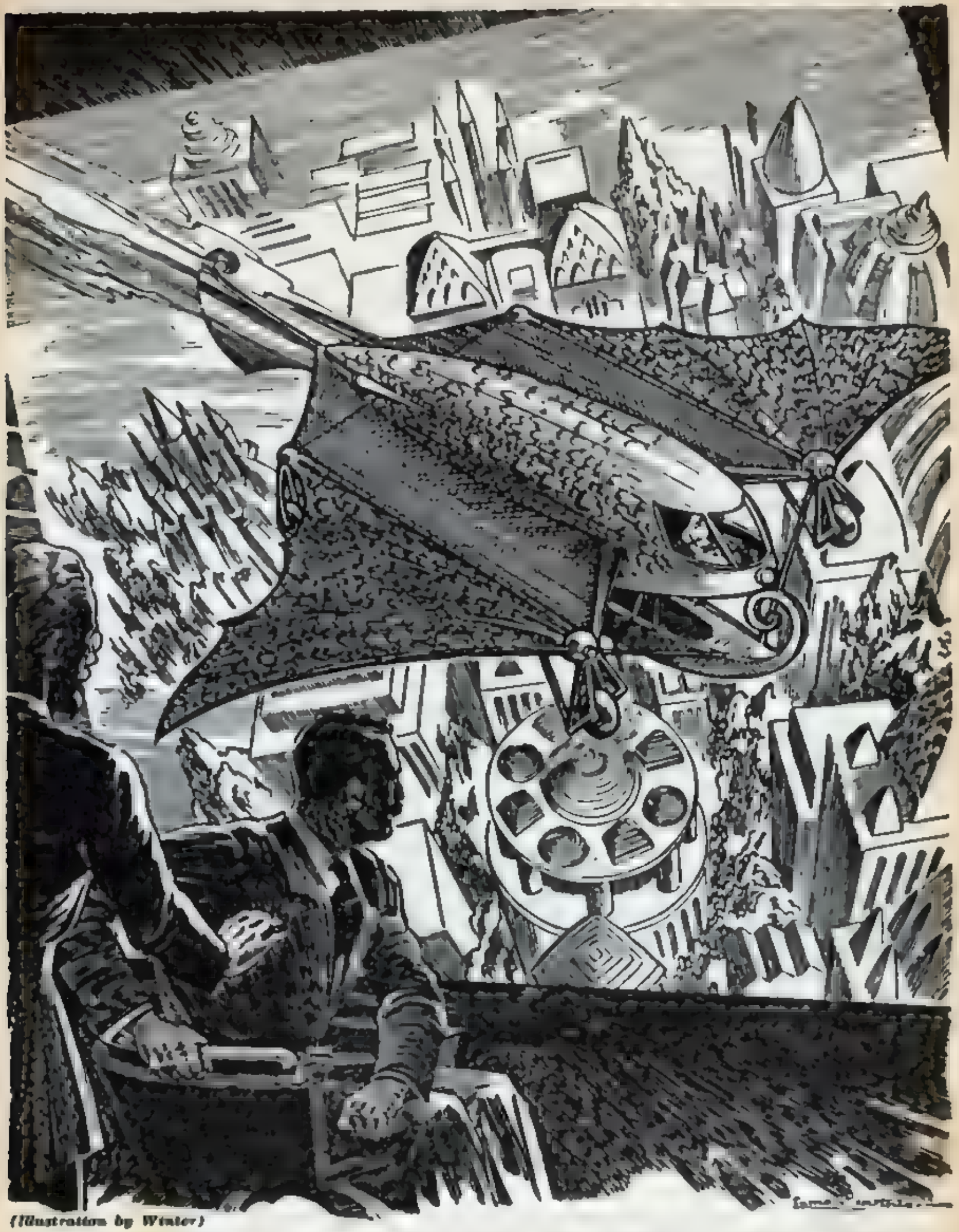
Try as he would, Lugi could not elude the air saurian. Wherever he ran, she was always just above him, screaming and hissing loudly. He became more and more terrified and ran wildly, with no thought of direction. His only desire was to escape the screaming menace above. When a clearing opened before him, he never hesitated, but dashed madly across it, which was the very thing Rayah had hoped for. In the open space there was nothing to prevent her attacking her quarry. Once more she dropped, and again it appeared as though Lugi was doomed. Then an unforeseen thing happened.

● While Lugi was fleeing from Rayah's wrath, another monster, attracted by the pterodactyl's screams, was racing towards them to investigate. Though Rayah was both fierce and terrible, here was a reptile that could surpass her in both respects. It was Gunda, the dreaded tyrannosaurus, king of all reptiles, and probably the fiercest creature that ever existed. Twenty feet he towered into the air, walking upright on powerful hind legs, and with his long, strong tail carried clear of the ground to form a balance. He was all of forty feet from the tip of this tail to the top of his massive head, and the cruel, hooked claws and the long, sharp teeth spelled disaster for all who came near them. The smaller forelegs, while never used as a means of locomotion, were admirably adapted for tearing anything unfortunate enough to come in their way and they were now gesticulating expectantly as the brute moved to meet the fast approaching cries.

Traveling twenty feet at every stride, he reached the clearing ahead of Lugi and Rayah, and as though sensing that they would pass this way, and that the spot might best be adapted to his plans, he concealed his great body as best he could, and waited. Occasionally the sun's rays would reflect from his scaly body, but otherwise, so still was he, a casual observer would not have discovered his presence.

Rayah, still screaming, came into view. Gunda had been watching the sky intently for her to appear, and now, as she sailed

(Continued on page 658)



(Illustration by Winter)

For a moment there appeared between us and the nearest roof, a flying creature of extraordinary construction.

THE SECRET OF THE MICROCOSM

By F. GOLUB

(Translated from the German by Francis M. Currier.)

● **Here is an excellent little story of relativity.**

Many scientists believe that the only difference between the solar system and an atom is size. If this is the case, the point of a pin is composed of millions of "solar systems" which are beyond the scope of the most powerful microscopes. It is said that there are so many atoms in a molecule, that if every atom was the size of a grain of sand, the molecule would be about as large as the earth—and even a molecule is too minute to be seen. This may help you to conceive of the size of an atom.

● Professor Robert Swenson was a close friend of my youth. That is why his colleagues often tried to learn from me what truth there might be in the rumor that he was working on an epoch-making invention. But I myself knew nothing about it, though I was no less curious than they. And now there suddenly came a telephone call from Swenson, asking me to come at once. In my excitement, I almost dropped the telephone. Immediately I asked, "Is it about your invention?"

After a long silence he curtly said, "Yes."

In less than a minute I had put on my coat and was speeding by automobile to Swenson's villa in the suburbs.

Swenson gave me a hearty handshake and smiled gaily. He was no longer the thoughtful, gloomy scientist, but the joyous, light-hearted Swenson I had known in my youth.

"I feel like embracing the first person that comes along, Edward!" was his greeting. "I am so happy about my invention, which has been successful with the aid of the apparatus I have devised. I shall not bore you with the details of construction. When the lacking parts are completed, especially the safety valve on which my assistants are working, I shall invite our worthy colleagues and explain everything in detail. Now I shall simply show you what I have so far accomplished. But first allow me to ask you one question. How would it be if the entire world, including ourselves, had been so infinitely diminished in size that the earth would be no larger than an electron, the sun no greater than the nucleus of an atom, and so on? Would it then be possible to exist on earth, and would anything be changed?"

I sank into deep thought—less about the question itself than about what Swenson meant by it. At last I replied that theoretically nothing need change, but that practically . . . .

"Practically it need not," interrupted Swenson. "You will soon see with your own eyes."

I tried to contradict him. "But . . . ."

"There is no but! How are you to prove that our earth is not a tiny grain of dust, lost in space, on which, by some happy chance, life has been able to evolve and develop, so that cranks like you may imagine that this grain of dust is everything? How are you to prove that our solar system is not an atom, a tiny atom?"

With an excited tone in his voice he went on again, as though explaining something to a stupid pupil. "Size must be understood to be just as relative as motion. When a train moves, it is relative to the surface of the earth. Size is equally relative. We measure it and understand it relatively to the earth, the solar system, and the stellar system. But what is represented by the milky way along with all

the stars and our sun? Perhaps it is only a tiny molecule of some higher matter. Who dares affirm anything to the contrary?"

I modestly replied that this proposition could not be demonstrated, any more than its opposite.

"But it can!" said Swenson. "I have succeeded in establishing just this proof, and I called you so that you might convince yourself of it."

● Swenson opened a narrow door and we entered a tiny chamber, the opposite walls of which were connected by a hollow cylinder of thick glass.

"Do you see anything in the cylinder?" asked Swenson.

I looked sharply. "Yes, I see a very sharp point," I replied.

"And on the point?"

"No, nothing."

He handed me a magnifying glass. "And now?"

"I see a grain of dust."

Swenson took my hand. "Good. Now come further."

The spacious hall into which we now came was striking because of its extremely high ceiling and because of an immense metal screen covering one entire wall. The wall opposite the screen had a small round opening, about two and a half meters from the floor, with two switches lower down. Swenson asked me to be seated and took his position before the switches. What he was doing there, I could not see. At last he turned around and raised his hand. "Pay attention!" he said.

The light went out. Then I heard a gentle buzzing, as though a fly were in the room. From the opening came a ray of light; the screen began to glow with an indescribably beautiful luminosity. In this there appeared, slowly and more and more clearly, a great formless porous mass.

"That is the grain of dust which you just saw," explained Swenson.

Gradually the mass disintegrated. It was no longer a whole. We saw a countless multitude of separate bits of mist, slowly moving in various directions.

"Now you see the individual molecules moving. The motion is fairly slow, because the temperature of the dust is close to absolute zero," continued Swenson.

The patches of mist made me think of the cosmic mists or nebulae which I had recently seen in the telescope. The similarity was startling.

The humming became louder. Now it was like the buzzing of an immense horsefly. The patches became larger and larger. Soon one single patch of mist occupied the entire screen, continuing to expand slowly but constantly. And suddenly—it was no longer a patch of mist. It had changed to an immense number of tiny spheres, slowly moving . . . .

"As you see," explained Swenson, "the molecule of dust presents something which reminds you of the nebulae in the sky, which mostly represents distant collections of stars like the Milky Way. Every individual sphere—the nucleus of an atom—represents, as it were, a star, merely reduced a countless number of times."

"But that cannot be!" I exclaimed.

"Please look!" went on Swenson calmly. "The spheres are luminous. They glow like our stars, for their temperature is as many times less than that of the stars as they themselves are smaller in size. I have calculated it. I did it with the aid of very sensitive apparatus, just as the temperature of the stars has been measured."

Zzzz—zzzz—

Now a bumblebee seemed to be buzzing monotonously and insistently. The screen resembled a starry sky. Still, however much I looked, I could not discover a single constellation I knew. It was another sky, distant and unknown.

"Yes, this sky is far away," said Swenson, as though reading my thoughts. "But, my friend," and the voice of the scientist had become loud and triumphant, "even under this sky there are living beings, actually rational ones. You will soon see them and then learn that space is really infinite. You will comprehend this infinity!"

● I could not see Swenson, but I imagined his triumphant figure with its burning eyes. I was seized by an inexplicable delight. I wanted to rush to him, to press his hand—but the screen kept me fixed in my seat. I could not turn my eyes from it.

Meanwhile, the luminous spheres were increasing more and more in size. After a few minutes, there were only a few of them on the screen, each as large as an apple. Soon there were only three, then only one, as big as a pumpkin, in the left corner of the screen. And then I saw, to my surprise, some dark points following the luminous disk.

"Electrons," remarked Swenson. "You know they represent bodies which move about the nucleus of the atom much as our earth and other planets move about the sun. Some move faster, some slower. Apparently, all elements are not separate individual substances of independent existence, but merely changes of kind, depending on the number of electrons (consisting of the primitive element) to be found in the atom. I forgot to tell you that the grain of dust which we have seen is a grain of the primitive element. I shall tell you later how I obtained it."

Swenson's voice was almost drowned by the mysterious sound, now powerful enough to remind one of the noise of a propeller. On the screen was the dim disintegration of the disk of an electron. In proportion to the further enlargement, some individual points on the surface of this ultra-microscopic planet began to become plain. Bright spots appeared, irregularly scattered on the dark background, while at the two opposite sides of the sphere, white dots stood forth, like the polar caps of Mars. The universe was revealing its secrets. Before us was being shown the structure of a microcosm. How like it was to that giant world we call the earth!

● A bright speck, becoming darker as the enlargement increased, was already spreading over the limits of the screen.

"One of the continents," Swenson shouted in my ear.

Without being able to turn from the picture, I nodded. The surface was coming closer. It was just as though we were plunging upon it . . . . Involuntarily I clutched the arms of my chair . . . .

Some vague lines—rectangles. Deeper down—never yet seen architecture and cyclopean structures of rare beauty. Ever nearer and nearer sped toothed pyramids of roofs, gleaming with gold . . . . Around were uncommonly high, bright green shrubs . . . . For a moment there appeared between us and the nearest roof a flying machine of extraordinary construction, reminiscent of a gigantic Pterodactyl, such as lived in prehistoric days . . . . Then it vanished from our field of vision . . . . It seemed as though I saw sitting in it a strange being, naked, with lemon-yellow skin . . . .

Directly before us flashed roofs with pointed tiles. Involuntarily I started back . . . . Suddenly . . . . What was it? A flame traversed the hall like a flash of lightning. Then there was absolute darkness. At the same time the mysterious noise ceased . . . .

I heard, or rather I sensed, Swenson leap to the switches. Without comprehending, I rushed there also.

"What has happened?"

"Damnation! The valve! Run! . . . ."

"But perhaps I can help . . . ."

A frightful explosion cut short my words. A giant force hurled me back to my seat . . . .

● I do not know how I crawled out of Swenson's villa or how I was taken up by the ambulance which came with the fire department . . . .

I did not leave the hospital for a month. That very first day, I visited the spot where Swenson's villa had stood. I found a gloomy ruin, cold and deserted.

I have never told anyone about Swenson's discovery. To be sure, I had no proofs. I never found anything to give the least hint as to the nature of my friend's invention.

THE END

(*Illustration by Winter*)

Steve could breathe again; but after a minute, the lunar monster found a new means of tormenting his captives. He began to twist Steve's arms, slowly, never quite to the point of dislocating the joints or fracturing the bones; yet the pain was maddening.

MOON PLAGUE

By RAYMOND Z. GALLUN

● Scientists, when predicting life on other worlds, declare that conditions must be somewhat similar to those of the earth in order to allow the existence of living creatures—especially highly organized or intelligent ones. They state, therefore, that our satellite is absolutely barren of life, because of its lack of atmosphere. They say that air is a positive necessity, because all creatures must breathe. Perhaps they are correct. No one knows.

Our author believes that if oxygen is necessary to support life, there may be other ways of acquiring it besides through respiration. If this is possible, it is very likely that intelligent beings can exist on the airless moon.

At any length, the story is very plausibly written. You will find this vivid adventure tale right up to the Gallun standard.

● Leisurely, old Steve Jubiston made his way along a narrow valley toward the laboratory-camp which his employer had established on the surface of the moon several months before. He was returning from that which, on earth, might have been termed a casual afternoon stroll. A short jaunt of this sort had recently become one of his usual pastimes when he had nothing better to do.

It had been some time since old Steve had been care-free, but he now had some time on his hands. His big, awkward body rolled forward with slow and distinctly sailorish strides. He whistled a blissful ditty inside the oxygen helmet of his space-suit, and his small blue eyes twinkled behind the glazed view-window, as they roved hither and yon, taking in the weirdly beautiful aspects of the lunar scenery. His metal-shod boot kicked casually at a fragment of obsidian that glinted in the sunlit dust of the trail. Now and then he would pause to hurl a stone boyishly up at the steep granite hilltops, and the rugged walls of small craters that towered about him, or to examine a bit of blue lichen,* which was one of the very few forms of plant life which the almost airless lunar surface could support.

Steve rounded a peculiar spire of grey rock, that was a well-known landmark to him. Then abruptly he stopped. The happy whistling died on his lips, and his battered features became solemn and concerned.

Unconsciously, he assumed a half-crouching attitude, on guard. The fine volcanic dust of the ground about him was marked with many curious indentations, which were certainly not like the footprints which a party of men, shod with space-boots, would make. They were too large, and their shape was oval. Old Steve felt a tingling thrill ripple along his spine.

Warily, he glanced along the ravine-like cleft, which branched off to the right from the valley which he had been following. The sun, which had already declined far down the western sky, left most of it in dense shadow, which his eyes, accustomed to the intense glare, could not penetrate. It was into these shadows, peculiar to the moon, where atmospheric diffusion

*Terrestrial lichens are peculiar composite growths, part fungus and part green algae. These two separate and distinct plants exist together in a state of symbiosis. (A combination in which two forms of life are mutually benefited by each other.) The fibrous skeleton of any lichen is a fungus which binds the green algae together, and doubtless serves as a means of retaining moisture, which is necessary for both plants. Since the fungus contains no chlorophyl, it cannot manufacture its own food, and for that reason is dependent upon the green algae.

Since terrestrial lichens are very hardy, and seem capable of thriving under the most rigorous of earthly conditions, I have assumed that the simpler forms of lunar vegetation are similar to them.

of light is practically lacking, that the indentations disappeared. They came from up the valley, in the general direction of the laboratory-camp. That they had been recently made was evident, for he had traversed the valley when he had started out on his jaunt, and they had not been there.

Old Steve felt a wave of apprehension. He fumbled at the apparatus at his belt, closing two small switches. "Mr. Melconne!" he called softly into the radio transmitter with which his helmet was equipped. "Mr. Melconne! It's me—Steve. Can't you hear me? Mr. Melconne—!"

For a long minute he stood statuesquely, like a hound at stance, listening, his mind troubled and uneasy.

But no reassuring word came through his phones. Only the quick rustling of his own pulse, magnified by the total absence of other sound, throbbed in his ears.

"They might have gone away from the radio for a few seconds," he told himself inwardly, in an effort to rid his mind of the tense unrest that had come over it. But no, that was against the rigid rules of the camp. While any member of the expedition was afield, there must always be some one at the radio.

Steve's eyes dropped again to the peculiar oval markings in the ashy lunar soil. Best to investigate without a second's delay. No harm at least to do so.

He started forward in long, easy bounds, for the weak gravity of the moon offered little resistance to his athletic muscles. And always, as he leaped over jagged rocks and tortured volcanic crevices, those strange oval indentations marked the dust under his feet, and continued ahead of him, along the trail toward the camp.

He came at last to a place where a crude stairway had been recently cut in the outer slope of a small crater's wall by members of his party. Agilely he climbed it, and peered intently into the inky shadows that shrouded the volcano's floor. The laboratory building, located at the bottom, was as completely hidden as if it did not exist.

Steve's eyes narrowed. Yes, there must be trouble here, otherwise there would be lights burning in the laboratory. He paused, his head hunched between massive shoulders, the excessive breadth of which was enhanced by the fantastic garb which he wore. Then slowly, cautiously, he started forward, down the stair cut in the steep, inner slope of the crater. He called again. Nothing came through his phones.

He became suddenly conscious of the brooding silence that hung, thick and heavy, over the fantastic world about him. The pit beneath was filled with a dense, almost tangible blackness, like a lake of ink. His eyes blinked at the farther rampart of the crater, glaring grey-white in the intense sunlight, yet somehow drab and sombre. He saw the distorted pinnacles looming beyond—twisted, motionless nightmares of this bizarre devils' paradise about him. His eyes roved to the sky. Instead of the normal blue of the earthly firmament, it was dark slate-grey, sprinkled with countless stars, even though the sun was well above the horizon. Those stars did not blink kindly; they merely stared, with an inscrutable brightness. It would not take much of loneliness in this empty world, to make a raving maniac of a man.

● In a sort of panic, Steve scrambled down to the crater's floor. Using his small flashlight, he made his way to the squat, circular structure which for three months had been the lunar explorers' home. The airlock was closed, but beside it there was a gaping rent in the double wall of sheet aluminum, and the layers of cold-resisting packing between them.

Old Steve's hard-set jaw tightened. His impulse was to rush headlong into the dark interior of the building, yet something deep and primal within him warned him to caution. He advanced warily, now and then calling in a hoarse whisper the names of the members of his party: "Mr. Melconne! Claire! Walker!" His only answer was an eloquent, deathly stillness.

The bright beam of his flashlight bobbed here and there over the walls and

floor. The latter was splotched with peculiar dried areas of a substance which had probably originally been a greenish, slimy fluid. The living quarters were in wild disorder; furniture, cooking utensils, and articles of clothing were scattered haphazardly about. Steve passed into the test room. Apparatus and equipment here had been hastily dismantled and carried off. The air-purifying machinery had been completely and methodically wrecked.

He made his way to the hangar, which was next to the test room. The great doors were flung wide, and both the spaceship that had brought the expedition to the moon and the small auxiliary flier were gone.

Steve's flashlight groped over the floor, and wavered upon a huddled form. He approached it. It was a human form, unprotected by any space-armor. The eyes bulged hideously, and the face was bloated and purple under the short, black beard. The teeth, between the curling lips, were flecked with foamy blood.

To have hinted in any way that old Steve Jubiston was soft, would have been the supreme insult to him; yet now, something that was very like a dry sob escaped from his throat.

The man on the floor was Frank Walker, Steve's side-kick during many an interesting episode on the Pacific, and in ports of the Far East. Steve was down on his knees, chafing the cold hands between his space-gloves before he realized that his act was useless—that this was a corpse.

He stared in vague bewilderment about the dark hangar, at a loss as to what move to make. Who had done this? The fact that much of the laboratory equipment had been taken away, suggested that a man, or a group of men with scientific interests was back of the deed.

A thought came to old Steve, and for a fleeting instant he fancied he knew who the criminal was. That thought brought with it an emotion that was stronger and more devastating than mere physical terror. It struck close to his pride, his self-respect, his hopes and his dreams. But no, he had guessed wrongly. That fellow was dead. Besides, the tracks—

Out of the lonely silence, which seemed for the moment filled with the piping, chuckling whisperings of a thousand little demons, there came a human voice. Steve started, then strained his ears to catch the words coming through his phones. Someone was calling his name weakly. It was Claire Melconne's voice. The boy was somewhere in the building, then!

Presently, after a feverish search, he found him trying to creep across the floor in the main living room. With awkward gentleness, Steve raised him, and placed him in a broken bunk.

"Hurt, kid?" he questioned, while he examined him as well as he could for indications of serious injury. He could not remove the boy's space armor, for to do so now that the air-tight walls of the building had been pierced, would of course have been immediately fatal.

"It's not serious," Claire Melconne reassured him. "Pretty well bruised up though, and I feel sort of sick . . . . Say, I'm sorry, but—well, Steve—Garth Jubiston did this. Garth and about twenty plant-men. You know, the specimen I shot just after we arrived. Garth has evidently become pretty familiar with them. Same kind of things. I—"

"Garth?" Steve questioned. His voice was almost a harsh whisper, that was nevertheless full of meaning. "But, kid, he must be dead! He left us six weeks ago. He couldn't have lived all that time without food, water, and oxygen! Think again!"

CHAPTER II

Garth and the Plant-Men

● Old Steve was thankful for the darkness that hid the look of pain which crossed his face. Garth Jubiston was Steve's younger brother. But the expression on the old sailor's face passed quickly. His lips became a hard line.

"No, Steve, he's alive," Claire told him. "The mere fact of the existence of the plant-men indicates that air and water are available somewhere around here,

probably in subterranean grottoes, as Garth once said. And where there's air and water, there might easily be food.

"Say, Steve, I know this thing is tough any way you look at it; but I've got an idea that maybe Garth has got a good reason for not being quite responsible for what he's doing. He's sick, Steve. He staggered a little when he was leading his forces toward the laboratory, and I got a glimpse of his face. His eyes were staring, and there was something across his nose and down along one cheek. Thought at first that it was grease or some other kind of dirt; but no, it was grey and fuzzy. Reminded me of something; a grey, parasitic growth which I found on some white lichens a couple of miles north of camp just a few hours ago. Garth found a similarly diseased lichen before all this trouble started, if you can remember . . . .

"I was in the test room, getting my diseased lichen ready for the specimen chest, when I happened to look out of the window. I saw Garth and his band just climbing over the crater rim. With their long legs, the plant-men looked almost like big, hungry spiders scrambling down a wall. It was sort of queer to see them so active out there, where there's practically no atmosphere. You have to think a couple of times before you remember that they've got thick, heat-resisting, cold-resisting, evaporation-resisting shells over their bodies, and that they are really green plants which can, with the aid of sunshine, of which there is plenty, manufacture their own oxygen from the thin atmosphere of carbon-dioxide* which exists around here.

"Not one of them was less than eighteen feet tall. Garth was in their midst, apparently directing them, as they came loping toward the laboratory. It was then that I saw his face . . . . All the plant-men carried big rocks, and I knew that they meant trouble. I warned Walker and Dad, and then got into my space-suit. But those things didn't waste much time breaking in. They just used their rocks. The walls crumpled up and broke like cardboard. I potted two of them with my automatic as they rushed in. Dad got another. Then a plant-man grabbed me in his tendrils, and threw me down upon the floor. I must have been completely out for at least a minute. When I came to, I could tell by the thumping on the floor under me that they were still in the place. I managed to get into the closet. I thought I'd get a few shots at them through the crack of the door, but I must have passed out again. Somehow, they didn't find me. That's all I remember until I heard you. I couldn't answer right away. We've got to do something, Steve

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*According to a theory accepted until recent years, the moon was totally without atmosphere. The sharp shadows and the complete absence of any atmospheric distortion of the details of the lunar terrain seemed to bear this out. Even stars, when occulted, or eclipsed, by the dark edge of the moon, showed no change in aspect, nor any irregularity in their apparent position, up to the very instant that they disappeared behind the lunar disc. There was no evidence of any atmospheric refraction.

However, during a solar eclipse in November, 1919, W. H. Pickering noted a prolongation of the cusps, or horns, of the crescent of the disappearing sun—a phenomenon which he believed was due to the refraction and diffusion of light by a lunar atmosphere. It was also noted that when a bright planet, Jupiter, for instance, was occulted by the *lighted edge*, or limb of the moon, a dark band, parallel to the lunar surface, was projected across the planet. This also indicated refraction by an atmosphere. When a planet was occulted by the *dark edge* of the moon, no such phenomenon took place. It is concluded from this that during the long lunar night, the air disappears, perhaps freezing, and deposits itself on the ground in the form of hoar-frost, which does not melt again until after sunrise.

There are several reasons why I have assumed that the air of the moon is mostly carbon dioxide. According to a well-established theory, just before life appeared on the earth, its atmosphere was made up chiefly of nitrogen and carbon-dioxide, with very little, if any, free oxygen. It was not until green plants started to decompose this carbon-dioxide, which was supposed to have come principally from volcanic vents, that there was any considerable quantity of oxygen. Oxygen is too active a gas, chemically, to exist in a free state for any length of time, when there are so many other elements with which it can combine. The oxygen content of our atmosphere is maintained only by the action of green plants.

Assuming that the evolution of the moon was somewhat similar to that of our earth, we can conclude that, today at least, a large portion of the lunar atmosphere is carbon-dioxide, since the moon has no extensive, if any, green vegetation.

In addition, the ability of a planet to retain an atmosphere seems to be in proportion to its gravitational force. It is believed that the atmospheres of all planets are slowly leaking away into space. With a gravity only one-sixth as great as that of earth, it is obvious that the lunar air would not only be more highly expanded, but would escape much more rapidly, because of the weaker force holding it to the lunar surface. Because carbon-dioxide is a very heavy gas, it would be retained much longer than the lighter nitrogen and water vapor.

According to Mr. Pickering, the maximum air pressure on the moon cannot exceed five millimeters of mercury, which, of course, is a very insignificant amount when compared to the seventy-seven centimeters approximate normal sea-level pressure on earth. Mr. Pickering's theory is not much more than a guess, but it is certain that the lunar atmosphere is very rare.

—quick. Our air'll be gone in a few hours. We've got to go—". Claire Melconne's voice trailed away.

Old Steve nodded slowly to himself. He was getting the fantastic affair straight at last. Plant-men—Garth. It was a bizarre thought that Garth should be associating with those strange lunar creatures; and it was still more bizarre that Garth should lead them against men in the laboratory, that he should cause the death of Walker, and place the rest of them in a position where extinction within a few hours seemed inevitable.

● Garth Jubiston was Steve's junior by ten years. He had been left an orphan when he was a small boy, and the responsibility of his raising had devolved upon his older brother. Since Steve's job carried him far and wide over the world, he hadn't seen Garth for long stretches of time; but old Steve had gotten the boy through school. Garth was ambitious, and he had something which Steve did not possess—a flash of genius. His advance had been rapid. Everyone who had known Garth had admitted that his record had been above reproach.

Finally, because of his ability, and because of his friendship with Claire Melconne, with whom he had become acquainted while holding an important instructorship in a large American university, he had joined the expedition.

Everything had gone well until some time after their arrival on the sidereal sphere. Claire had shot the plant-man—the only one they had seen. Garth had been intensely interested in the creature. Shortly afterward, they had prepared a collection of strange lunar lichens, to be taken back to earth. Among them had been the white lichen with the parasitic grey spots—the one Garth had found.

Almost immediately, Garth had become irritable and abusive. During the next few hours, he had made two trips alone and on foot, away from the camp. Then, when all the others were sleeping, he had returned, and had gathered together a few of his belongings before starting out again. The brief note he had left had informed them caustically that he hoped that they would all find their way to Hell in the near future.

Steve and his companions had searched the surrounding country for the fugitive for many hours. Once, when they had been traversing a narrow cleft, a bullet had glanced off Professor Melconne's oxygen helmet, and a mocking, maniacal laugh had grated in their head-phones. But they had failed to catch even a glimpse of Garth. Until long after his eight-hour supply of oxygen should have been used up, they had continued their quest, but without results. Finally convinced that Garth was dead from suffocation, they had given up.

And now Garth Jubiston had come back, and had done this! Black fury smoldered in old Steve's mind, but there were questions there also.

Steve knew about the plant-men. They had rather carefully examined the specimen Claire had shot. The explosive bullet had torn it badly, but the carcass had been complete enough to give a fair idea of what it had been like in life. It had stood perhaps eighteen feet tall. Its two stalky, many-jointed legs were covered with countless matted brown fibres, resembling roots. A tough, leathery mantle of bright leaf-green, oddly reminiscent of a military cape, hung over its spiny ovoid body. From the edge of this, its tactile tendrils, or tentacles, projected. The creature had no head. At the top of its body was a sort of hard brown shell, resembling the calyx of an enormous flower. It was not difficult to imagine that when the occasion demanded, the plant-man's entire vulnerable anatomy, including his long legs, could be drawn into, and sealed in this shell, which might serve as a protection during the intense cold of the lunar nights. Sprouting from between the sections of this integument, was a long forked stalk, bearing two globular organs. One of these was clearly an eye; the other seemed to be a light-producing organ like those of fireflies, for even after

the creature was dead, the globe had emitted a faint, greenish glow.

The four men had discussed the creature rather fully. It had seemed very strange to them that a plant should assume so many of the characteristics of animals: the ability to move about freely, intelligence and so forth. But they had agreed that there was nothing impossible about it. They had recalled that various earthly forms of carnivorous flora, the Venus Flytrap for instance, are able to move their parts with a rapidity comparable with the movements of animals. They also remembered that these plants give evidence of possessing intelligence, or at least a rudimentary nervous system, that might, through a process of evolution, develop into a thinking brain.

The requirement of carbon-dioxide for green plants was taken care of by the thin lunar atmosphere made up chiefly of that gas. Under the action of the strong lunar sunlight, the chlorophyl in their tissues converted it into free oxygen and starch, which served as fuel for their muscles. And the carbon-dioxide resulting from this oft-repeated chemical union was again split up to supply food and air for the plant-men. All this was clear. One thing puzzled the Earthians, however. How did the plant-men obtain their necessary water? The thick skin of the creatures would resist the evaporation of body fluids quite effectively, but where did they get their water in the first place?

Professor Melconne had offered a theory. "There must be a place, in some deep cavern, possibly, where there is a soil containing moisture, where the plant-men can, at periodic intervals, bury their roots and absorb the necessary water, and also the silicates and other minerals necessary for the building up of their tissues," he had said.

"You're right, Professor," Garth Jubiston, still his old eager self, had exclaimed. "See!" He was pointing to the brown, thread-like hairs growing on the lower limbs of the plant-man. "There are fragments of dried clay clinging to those roots. There is a place, and we'll find it!"

That was the story.

CHAPTER III

The Horror of the Grey Mold

● And now old Steve Jubiston was thinking fast. He knew that his own air supply couldn't last for more than two hours. The kid's would probably last longer because he had donned his spacesuit an hour or so later. Since the air-purifying machinery of the camp had been destroyed, there was no easy means of getting more. Something would have to be done during those two hours, or death by asphyxia would come upon them, prompt and certain. The lunar night, with its dreadful cold, that could bite through the thick, insulating material of their space armor, was not far off.

Steve shook Claire Melconne gently to arouse him from the semi-stupor into which he had fallen. The boy mumbled incoherently at first, then, realizing their position, brought his mind back to lucidity, apparently by sheer force of will. . .

"As far as I can see, Claire," said Steve, "there is only one way out of this mess for us—to follow Garth and the plant-men. They evidently know where there's a supply of breathable air. They have both shown themselves to be our enemies, and we'll have to treat them as such. Besides, your dad is probably a captive. We've got to attempt to rescue him. You know our chances. Think you are equal to the task?"

"Sure!" replied Claire Melconne, attempting to make the word sound brisk. "I feel a little groggy yet, but I'll be all right. A little exercise—" He had staggered up from the bunk, and stood drunkenly on unsteady legs.

Old Steve had his misgivings. The plant-man had certainly thrown the kid pretty hard. Claire ought to be in bed, under the care of a physician, but there wasn't anything that Steve could do about it. He couldn't very well leave the boy

here, for if he did, it was hardly likely that he could bring a supply of oxygen back to him in time. To stay in the laboratory with him, and wait supinely for the end, was utterly against Steve's grain. The only thing to do was to take Claire along.

With the boy leaning on Steve's shoulder, they made their way out of the building. Through his phones, Steve could hear Claire's labored breathing. Now the youth coughed raspingly. There was little strength in his battered body. Steve almost carried him up the steep slope, over the crater wall, and down into the valley, which was now a harshly mixed medley of dense shadow and patches of brilliant sunshine.

They started to follow the tracks made by the plant-men.

The youth seemed taken by a sudden thought. He disengaged his arm from about the older man's supporting shoulders, and staggered a few steps away from him. "Steve," he said with husky earnestness. "I think I know what changed Garth. It was that mottled fungus he found just before he left us. He handled it, and some of the spores settled on his skin, and took root there, beginning to eat his flesh. There isn't anything impossible about that, of course. Our ordinary ringworm of earth is caused by a microscopic fungus or mold. It was this lunar fungus that poisoned Garth's blood, and deranged his mind."

Claire paused. "And now, Steve," he went on, "I think—well—that the same kind of fungus is attacking me. I found one of the plants just shortly before the lunarians arrived. When I packed it away, I handled it with my bare hands. My hands and forearms are smarting now as though I'd rubbed them with the juice of nettles . . . . "

Claire's voice became even calmer and more earnest as he continued: "Let me out of this, Steve. It isn't fair. I'm just hindering you. Without me, you've got a small chance, but this way we're both doomed. I'll tell you what, Steve—you take my oxygen supply—"

Steve checked him. "For God's sake, kid! Do you think I could—"

"No!" Claire shot back. "Of course you couldn't. I know you well enough to be sure you wouldn't do that to your worst enemy. But still there are ways of making you, Steve." The boy's eyes blazed defiantly in his white face, and his lips were set hard. "I'm going to take my medicine now, Steve," he continued, "and give you half a chance." His hand was on the feed pipette which led under his arm from the oxygen tanks on his back to the forward portion of his helmet.

Steve read determination in Claire's features, and something else perhaps. It wasn't hard to guess what the boy meant to do. If that feed pipette were broken—and a fierce jerk would do that—Claire would suffocate in a few moments.

Old Steve did not hesitate. With an oath, he flung himself at his companion. "You damned fool!" he hissed. His fingers sought to clutch the youth's wrists. Securing a hold, he attempted to tear Claire's hands away from the pipette.

But for the moment, Claire seemed to possess demoniac strength, in spite of his weakened condition. They struggled silently. The boy's teeth were bared in a sort of frozen snarl. The flexible pipette of segmented metal was giving.

● A laugh coming through their phones suddenly arrested their attention. It was a thick, rasping sort of laugh, filled with a horrible, morbid mirth. Then a voice spoke: "Misunderstandings will occur among the best of friends," it chuckled maliciously. The cracked, dry hoarseness of it made it almost unrecognizable, yet they knew it to be Garth Jubiston's voice.

Still clutching at each other, the two men looked about. Gliding slowly toward them over a nearby mountain peak, was the small space-boat which had been stolen from the hangar. Its duralumin hull glistened brilliantly in the sunshine.

This new development seemed to have steadied Claire. He tore himself free from Steve's grasp. Automatically, his hand leaped to the holster at his belt, seeking

the long-barreled pistol which was loaded with explosive Corlissite projectiles.

"Don't fire, Claire Melconne," Garth Jubiston warned. "Your father is aboard this vessel. You would not wish to kill him."

The boy's pistol arm hesitated, then dropped.

"I thought that I would find you two around here somewhere if I returned," Garth continued. For the moment, his speech seemed quite coherent. "While I guided the ships to their new hangar, my friends, I overlooked you. But my minions are going to capture you for me now. First, however, I'll talk. Don't move. You are completely surrounded." Garth had begun to laugh again. It seemed that he would never stop. However, this induced a violent fit of coughing. When Garth was able to talk again, his voice was weaker. He gasped for air.

"I'm going to feed you to the mold," he hissed through his teeth. "I'm going to watch you suffer—both of you. And I've got the professor here. He brought me to this hell-hole. It will be great fun to watch the mold chew away your skins!" Again Garth laughed.

Then his jangled mind started off on a new track. "You wonder what I've been doing since I left you," he went on. "I followed a plant-man to the tunnel which leads to the Crystal Mountain. There is their world. What is the Crystal Mountain? You'll see before you die. It is the most marvelous place on the moon! At first the plant-men wanted to kill me, but I awed them with my pistol, and I became their god. Their language consists of light signals. I determined to learn it. From the odds and ends I carried with me, I devised a simple apparatus to produce such signals. The language itself is simple. I have practically mastered it now, and I can give my divine commands quite easily. I'm going to tell them to capture you now. You may resist if you like. Watch!"

"You're acting like a damned fool, Garth," Steve said quietly.

Again came that dry, cackling laugh. "Go ahead and plead for mercy!" Garth Jubiston fairly shrieked. "Go ahead!" He moaned slightly.

A look of pity softened old Steve's hard features for a fleeting instant, then his face grew grim. This was not the Garth Jubiston of old. It was just an enemy, a maniac possessing some of Garth's skill, and doubtless still able to be diabolically clever.

Dragging Claire with him, Steve darted into the questionable protection of an area of dense shade. Would the boy crack too, when the grey mold had eaten a little deeper into his flesh, and had gotten into his blood-stream? There were no definite signs yet, but Steve was sure the symptoms would appear within an hour or two, if they weren't already dead by then.

Old Steve had no weapon. When he had started out on his jaunt, he had not thought it necessary to arm himself. Except for the plant-man of several months before, no living creature that could offer a menace to the earthmen had been seen; therefore, a pistol had seemed superfluous. When he had returned to the laboratory, the meagre arsenal of guns and ammunition had been stripped.

Several flashes of light, some green, some red, flickered from the nose of the space-boat above.

Close on the heels of the signals, three bizarre figures charged out of the maw of a nearby cleft. The giant plant-man came toward their prey in long, swinging strides. Sand and rock fragments were scattered by their oval hoofs, as their great, horny bodies bobbed eccentrically along. They bore no artificial weapons, yet they were fearsome enough with their long, green tendrils, coiling and uncoiling about them menacingly. The two globes, which were supported above each of their bodies by a forked stalk, swayed like the hooded heads of cobras that are preparing to strike. From one of each of those pairs of globes came excited pulsations of baneful light, some green, some red, and from the window at the nose of the space-boat there were answering signals.

CHAPTER IV

The Recovery of the Space-Boat

● Flight for the two men would have been useless, since these lunar creatures could cover the ground so much more rapidly than they. Claire and Steve stood their ground. Leaning weakly on the shoulder of his massive companion, the boy levelled his pistol. There were three silent flashes from the muzzle of the small weapon, followed immediately by three more among the ranks of the plant-men. The great awkward forms, ripped to fragments by the force of the explosions, crumpled grotesquely among the ash and rocks. Their sticky, chlorophylous body fluid, suddenly exposed to the almost pressureless vacuum of the moon, seethed and bubbled as it rapidly evaporated.

"Good work, kid," old Steve muttered.

They wheeled about. Two other plant-men were rushing at them from behind. Claire fired again, but a thin veil seemed to be obscuring his vision, and his aim was not as good as it had been before. A second shot dropped one of the attackers, yet by this time the remaining one was so close upon them that to fire again would mean that they, too, would be killed by the force of the explosion.

Old Steve sprang boldly at their huge adversary, striking out at it with his metal-gauntleted fists. But it was a futile gesture. A half-dozen of the plant-man's tentacles grasped him about the middle, and hoisted him from the ground. Steve could do nothing but writhe and kick furiously. The monster quickly caught Claire Melconne, tore the weapon from his grasp, and hurled it far to one side.

They heard again Garth's rattling, malicious laugh. "You tried to resist my people!" he screamed. "You tried to resist me! But the plant-man will have his pay for his fallen comrades. I shall tell him to take his revenge. But be assured that he will not kill you. Your time is not yet!"

With pulsating surges of changing color from the nose of the space-boat, his command was given. The plant-man flashed a short acknowledgment.

His tendrils tightened slowly about his two captives. Gradually, a crushing force was brought to bear. Steve fought the constricting coils, clawing, tearing at them. He got a hand under one of the looping, green, vine-like members; his powerful muscles surged mightily. His battered face reddened with the effort, yet he accomplished nothing. This eighteen-foot lunar giant was many times stronger than he. His breath was nearly gone, and little sparks of darkness danced before his vision. Above him, on the forked stalk, wavered the two globes, the left one, an eye, the right one, a signaling organ. There was a menacing, vengeful glint in the opalescent depths of the left globe.

Claire was fighting too—weakly. The kid was all pluck, but he'd had a bad start. Old Steve heard his faint, choking cry; then the boy went limp.

Garth Jubiston spoke again: "Pleasant, isn't it?" he asked sarcastically. "You people of earth may be great upon your own world, but you are nothing to us plant-men. We have skill; we have metals. We shall build a great space-fleet, and conquer your world!" Garth's voice rose to a rasping scream. "No, that cannot be! I must die!—by the grey mold. It is my duty! I—"

Something attracted the madman's attention; for his train of thought stopped abruptly, and he began to curse.

Steve's dimming vision saw the space-boat swing erratically from its course, and go wobbling away from them across the sky. It was losing altitude. Presently it dropped behind a jutting crater wall.

Tortured though he was, old Steve was exultant. Garth had suffered a mishap of some kind; and he felt that it was not necessarily an accidental one. He knew that Professor Melconne was aboard the vessel. Melconne could be depended upon to take every chance that was offered.

The plant-man slackened his constricting grip somewhat, as he hurried forward

in the direction of the place where the space-boat had evidently landed. Steve could breathe again; but after a minute the lunar monster found new means of tormenting his captives. He began to twist Steve's arms, slowly, never quite to the point of dislocating the joints or fracturing the bones; yet the pain was maddening. Silently, Steve endured it, biting his lip to force back the outcry. Steve was thankful for one thing. Claire was unconscious, and the plant-man was not bothering to do him any further harm.

What had happened to Garth and the space-boat? The question in Steve's mind was answered presently, when his brother spoke: "Do you hear me, earth-men?" he asked. "Yes, you are there, for I can detect your heavy breathing. I have had a little mishap. The good professor freed one hand, and tossed a piece of metal into the stabilizing mechanism. But the damage is slight; I shall have it repaired in a few minutes. Then I shall attend to the professor. I am trusting my henchman to bring you here."

A maddening fury was surging up within old Steve's breast. Yet, by exerting a fierce effort, he managed to check the flood of hate that was trying to come to his lips. To voice it would have been worse than useless. That Garth had lost his reason through the ravages of some dread lunar disease, no longer was an adequate excuse for the man. Steve's rage was beyond the power of excuses to lessen. God! If he could only get his hands on that skunk for a few seconds! His aching, pain-racked muscles and his throbbing brain fairly cried out for revenge.

The plant-man came to a precipitous slope that slanted sharply down for a distance of several hundred feet. It was strewn with jagged volcanic rocks. With careful steps, the lunarian started to descend.

● Something seemed to snap in the old sailor's mind. As he dangled from the plant-man's grasp, his feet were about on a level with the mid-portions of the monster's legs. Steve saw his chance, measured its slim possibilities and its great hazards, then took it. He swung his body inward, and grasped one of his captor's legs firmly with his knees, at the same time struggling violently.

It was over in a moment. Tripped and thrown off balance, the ungainly lunarian pitched forward, releasing his grasp on his two captives. As the monster rolled and tumbled down the slope, amid a shower of ash and rock fragments, Steve caught hold of a firmly embedded piece of hardened lava, and saved himself. He had the advantage of lightness, and vastly superior agility. The limp body of Claire Melconne had started, less precipitately, to follow the plant-man; but Steve darted to it, and caught him in time.

"Now," old Steve muttered, very softly to himself. His eyes fairly blazed in his glistening, sweat-streaked face. Brother or no brother, Garth Jubiston would pay, and pay dear.

Tossing Claire to his shoulder, he descended the rocky slope. Picking out the crater behind which the flier had disappeared, he hurried forward. Garth couldn't be more than a mile distant from him.

But he'd have to hurry. He'd have to arrive before his brother could finish fixing the stabilizer. The task might already be completed. If it was, Garth would be leaving the ground in a second or two; then it would be too late for Steve to act, to gratify the dark thoughts in his mind.

A grim smile creased the old sailor's hard face. It did not detract any from the fiendishness of his expression; rather it added to it. If he could attract Garth's attention to him by talking, he might delay the take-off of the flier for a few moments. Then—Steve's metal-cased fingers crooked suggestively.

He began to curse, to groan, to cry out for mercy, as though he were being unbearably tortured. The sounds he made were realistic enough, and they were all for Garth's benefit.

All through those histrionic evolutions, Steve's terrible smile persisted. He ad-

vanced more like some huge, vengeful beast than a human being.

His ruse was having its effect. He heard Garth Jubiston's voice, cursing him, taunting him, laughing at him with that horrible, harsh laugh. In a way, the sound was pitiable, but there was no room in old Steve Jubiston's heart for pity now. Irony! It was too bad Garth didn't know that he, Steve, was hastening toward him with murder in his heart. But Garth was still clever, with the cunning of the maniac he had become.

Panting and sweating with exertion, and because of his tumultuous emotions, Steve topped a rise in the ground. He peeped cautiously over the summit. The flier rested down there among the volcanic ash and débris. It seemed deserted. No, something moved out of the long ebony shadow it cast. Garth was walking unsteadily around the vessel, apparently making a tentative survey of its outer mechanisms.

Steve deposited Claire on the ground in the shelter of the rocks. The boy was muttering feebly. His consciousness was returning.

Crouching down like some jungle cat, Steve waited for Garth to turn his back. It would be foolhardy to charge into the muzzle of a blazing automatic. The opportunity came. Soundlessly, he hurtled forward. His crooked fingers were almost upon their prey before the man became aware of his presence.

Some moments later a voice checked the seething fury that possessed old Steve. It was Claire Melconne crying hoarsely from the ridge. "Steady, Steve, for God's sake! Remember; he's probably the only person who knows where we can get another supply of air. Maybe it's too late already!" Claire was approaching with tottering steps.

Steve dragged the limp form of his brother to the airlock of the space-boat. He entered the cabin with Claire. They found Professor Melconne firmly secured with metal cords to one of the vessel's heavy duralumin ribs.

CHAPTER V

The Search for the Crystal Mountain

● When they had released the professor, he immediately closed the switches which put the radio of his space-suit into action. "Thank God you're safe," he cried. "It was almost too much to hope that you would be able to get here!" His thin old face was working with emotion. Briefly, they told him what had happened to them. His tone changed when he saw Garth. "You didn't kill him, did you, Steve?" he questioned quietly; but his words were heavy with meaning.

Steve shook his head. "I should have," he said fiercely. "Say—where is this place called the Crystal Mountain, Mr. Melconne?"

"I don't know," the professor replied ruefully. "I've been a captive in this space-boat since the attack. Most of the time, something opaque was wrapped around my helmet. I could feel the vessel climbing, descending, and zigzagging tortuously; but I couldn't see."

"Which means?" Steve cut in.

Professor Melconne completed the phrase: "That unless we can get the location from your brother, or find the way ourselves, we are doomed to smother within an hour. The ship's oxygen is all but used up, and I can guess that your supply is not so large either."

"Maybe it's better than to die by the grey mold, Dad," Claire suggested.

"Perhaps," Mr. Melconne returned. "But it's human nature to fight for your life. Garth sprinkled my skin with the spores a short time ago. The itching and burning is bad, but I'm not going to crack yet. Hang on, boy!"

Still protected by their own armor, they removed the space-suit from Garth Jubiston, and placed him in a bunk. Part of the fabric of his clothing, rotten with the grey mold, crumbled in their fingers as they sought to peel it from him. Presently, he lay there naked. There were large, irregular areas of a grey, silky substance scattered over his body—his arms, legs, torso and head. The stuff was like mole's

fur, except that when one touched it, it rubbed away, leaving hideous areas of raw, purulent flesh. Garth's skin was hot and feverish. He panted heavily, yet his half-open eyes were fixed and motionless, and seemed to see nothing. The whites were very bloodshot, and a fine, grey fuzz clung to the lids. There was fuzz, too, in his nostrils, and there was a large, red-rimmed patch of furry mold along his jaw-bone, beneath one ear. Some of the more hideous sores were bandaged with dirty, crumbling gauze from Garth's first-aid kit, evidently. During his more lucid moments, he had tried to combat the disease.

Steve was kneeling beside him. His cheeks had paled a trifle, but his face was still grim. Unmindful of the danger of contracting the plague, he had opened the vents in the forepart of his helmet, so that he could speak to his brother, who, he knew, was near death.

"Garth," he called softly. "Garth!" Gently he grasped the younger Jubiston's emaciated shoulders, and shook them.

Garth's cloudy gaze wavered. In a foggy way, as though he were being aroused from a hashish dream, he began to be vaguely aware of his surroundings. His eyes turned toward Steve; remained there for a long moment—puzzled. There was no malice in them.

"Why, Steve—old fellow. I'm sorry. Is it time for my watch? I shouldn't have slept so long. Now—" A vague, fearful expression came to his features, doubtless due to the rasping, unnatural sound of his own voice.

Steve winced. His watch. A fragment of Garth's old, sane, likable self—a fleeting fragment.

"Where is this place which you call the Crystal Mountain?" Steve asked with level quietness.

He knew immediately that he had made a mistake. Garth's eyes widened in understanding; then his lips twisted into a leer, and he began to laugh , . . .

Steve had been only vaguely aware of the presence of the two Melconnes who crouched beside him. But now he felt hands clutching fiercely at his metal-clad shoulders. They were Claire Melconne's fingers. "It's your fault!" he was screaming. "He's your brother, Steve Jubiston. You let him do this to us! I'll be like that! Furry! Moldy! Like a piece of rotten food! I'll kill you!"

The kid was cracking. Steve knew it at once. The poisons which were in his blood were already acting on the boy's nerves and brain. The sight of Garth's hideous, diseased body, was the straw that was breaking him. Steve arose, grappling with Claire, clutching at his flailing arms, trying as gently as possible to restrain him. Professor Melconne was helping.

Their attention was drawn to Garth. With a sudden burst of strength, he arose to his feet and raced to the airlock. Before Steve and the professor had an opportunity to prevent it, he had unbolted the inner airtight door, and had darted through. They heard his mocking, maniacal scream, as the automatic safety device reclosed the panel. They knew that Garth was racing naked out over the airless lunar terrain. Yes, now they could see him through a window. His bare feet were pounding fiercely at the chalky ground, in that mad sprint to death. His head was uplifted to the stars; his lips were gasping. They saw him stumble at the brink of a steep slope, and go tumbling like a battered and discarded rag-doll.

● It was useless to make any attempt to save him. For a long minute, they stood staring after him.

Claire was the first to speak. "I'm sorry, Steve," he panted. "I know it isn't much of an excuse, but—"

"I know, kid," Steve said dully. "Now we've got to look for our own air." He had turned away, and for a moment seemed deep in thought. "As the only really well man on this boat," he continued carefully, "I believe that it is both my right and duty to assume command. I can handle the flier alone. Therefore, I think it would be best if you both took a hypodermic and went to sleep."

Professor Melconne seemed about to

remonstrate, then, sensing Steve's unspoken meaning, thought better of it. "You're right, Steve," he said. "We're not to be regarded as trustworthy, and it will be much better to have us out of the way temporarily at least. Good luck!"

Without asking any questions about what he intended to do, Mr. Melconne and his son retired from the control room to the small chamber behind it.

Old Steve went to work. He had no plan other than to search the lunar terrain until he found some clue, or until the last dregs of oxygen were gone. Forty minutes was all the time he had.

A small black notebook lying on the floor beside Garth's clothing, caught his eye. Hurriedly he picked it up and began to thumb through it. It contained Garth's notes, some taken before he had left camp. He skimmed quickly through these, coming to several pages on which many capital R's and G's, arranged in groups appeared. After each was a brief explanation: RRGR—Come this way! RRRG—kill! Steve understood. Here were Garth's notes on the plant-men's language. The R's stood for flashes of red light, and the G's for flashes of green. A strange, paradoxical thrill of pride came over him. Even during his sickness, when he played god to the plant-men, Garth had been the scholar and the delver after knowledge. He'd had his fairly lucid moments, of course. But the key wouldn't do any good now.

In quest of some possible clue to the location of the place he sought, he scanned each page. He found nothing. However, on the last of the written leaves was a brief note which immediately riveted his attention. He read it avidly. Then a wild look, half of triumph and half of despair, flickered briefly on his rugged features. If he could only somehow find his way to the Crystal Mountain! It would mean so much! God!

Seated before the control panel, he closed the starting switches. The generators that fed power to the levitator and repulsion plates began to whine . . . .

From an altitude of a thousand feet, Steve looked down upon the moon. Night had almost come. Except for one frosty wing of her corona, the sun was almost invisible. Only a small segment of her disc still peeped above the serrated horizon. These last thin rays gilded only the mountain peaks, and the tops of crater-brims. Only the brightening light of the half-earth was left to soften the blackness of the deeper valleys.

CHAPTER VI

The Mystery of the Plant-Men

● For over twenty minutes, Steve had searched without success. He sat in the pilot's chair, hunched over the control levers. His eyes continually scanned the tortured terrain that spread vague and unreal beneath him in the feeble light. He knew what his chances were, yet, doggedly, he kept at his task.

A broad, squat mountain peak reared under him. At first glance it did not seem any different from the hundreds of other isolated peaks, which are common on the moon. Then, as he continued to gaze at it, he saw numerous shifting points of frosty light on its slopes. The phenomenon was doubtless caused by earth rays, shining on, and being reflected from, vast deposits of rock crystal with which the peak was loaded.

Was this Garth's Crystal Mountain? Taken by the idea, Steve sent the spaceboat rocketing downward, so that he could get a closer look at his find. His small searchlight played on the rounded slopes. The beam sent back diamond-like reflections. Yes, the mountain seemed to be composed almost entirely of crystals that looked like worn and dusty glass. A flash of hope came to old Steve. This might easily be called the Crystal Mountain!

His craft swooped around sharply as he continued to examine the peculiar natural formation. But no, his searchlight revealed nothing that might indicate that this mountain was more suited to support life than any other portion of the moon. If possible, it was more desolate and barren.

Disappointed, Steve continued with his quest, guiding his craft in ever-widening circles.

His time was nearly up. Already the oxygen escape-valve had ceased to hiss.

Then Steve saw a series of red and green light flashes, flickering eerily through the dusk beneath. In a moment they were gone. An idea came to him. Why not follow a plant-man? They would be hurrying to a place of cover, now that the lunar night, with its awful cold, was coming on. Fool! Why hadn't he thought of that before? It might be too late, now that he could no longer see the plant-man.

Eagerly, he waited for the creature to signal again, so that he could tell where it was; but the flickering lights did not re-appear.

Steve was desperate. He picked up Garth's notebook, a half-formed plan throbbing in his mind. Feverishly, his gauntleted fingers scrambled through the leaves. He glanced down the columns of symbols, scanning each explanation of meaning. RGRGR—Greetings. It might serve the purpose! At least it was worth a trial.

On the calculation desk at his side lay what appeared to be an ordinary flashlight, but a brief examination revealed that several things had been done to it. Instead of having only one cold-light globe, it was fitted with two, each of which was equipped with a separate button-switch. One of the globes was smeared with a green pigment, and the other with red.

Steve took up the flashlight, and holding it close to the window, flashed out the signal—red, green, red, green, red.

Eagerly he watched for an answer. There it was, far down in the darkened valley. Red, green, red, green, red—flickering eerily.

He sent the space-boat skimming toward it. Approaching close to where the plant-man had been, he checked his speed to a crawl. It would not do to frighten the creature, who of course thought that Garth was guiding the vessel.

Again he signalled, and was answered, this time from a greater distance along the valley. And so the plant-man led him on, over the rough ground, reaching at last a small crater, over the walls of which the lunarian disappeared.

● Hovering, Steve played his searchlight into the crater. In its floor yawned an immense chasm, sweeping down into misty darkness. The bright beam stabbed into a thin, whitish vapor that steamed up out of the pit. In it, white particles that looked like snowflakes were forming and swirling. Was the steamy stuff really water vapor, or was it carbon-dioxide gas brought to the congealing point by the chill of the lunar night? Steve had no means of knowing; yet the presence of either might indicate that he was on the right track.

The chasm yawned black and forbidding. Steve hesitated. Might he not be following a false lead that would bring him and his companions to destruction? There was no evidence of a Crystal Mountain here. Moving the directing levers of the searchlight, he sent the misty beam groping for the plant-man. After a moment, he found him. The creature was hurrying along a trail that spiralled down around the walls of the pit. His fantastic figure was swaying, loping along at topmost speed, as though he were frightened.

Steve drew a deep breath, then eased the control stick forward. Under the guidance of his cautious fingers, the vessel dropped into the black orifice. It continued to descend vertically for a distance of almost two miles; then the rocky tunnel curved outward, becoming horizontal. Sweeping the searchlight here and there over the jagged walls, Steve continued to advance into the dense shadows. The dark openings of many side-passages came into view. The barometer indicated a steadily rising air pressure in the tunnel. Evidently, there was still a trace of volcanic action here, giving rise to a copious outward flow of carbonic acid gas from the heart of the moon.

Where would the passage lead him? Would he find the place that he sought;

the Crystal Mountain? Certainly there could be no Crystal Mountain way down here!

Abruptly, the volcanic corridor turned upward. As Steve guided the space-boat in the long ascent, he detected a faint glow far above.

Puzzled and wondering, Steve emerged into a vast place where prevailed a faint, half-revealing luminescence, like eldrich moonlight. He glanced through a window and saw, or fancied he saw, the dim shapes of fantastically formed trees. He played his searchlight groundward, seeking a landing place.

Having brought the vessel to rest, he opened a small aircock, which led through the double walls of the craft. A faint stream of vapor came through the valve. Tentatively, he tested it with his nose. It was real air, warm and humid.

Unprotected by his space-suit, he hurried eagerly through the airlock. His feet felt moist earth; about him were bushes. A soft inviting breeze fanned his cheek. Still puzzled, he looked upward toward the source of the illumination. It took almost a minute of scrutiny before the explanation of the glow was clear in his mind. Yes, this was Crystal Mountain all right; doubtless the same mountain he had examined before he had followed the plant-man. But now he was inside it! The vast dome above, which evidently had been formed by volcanic action in some remote age, was made up of translucent rock-crystal. The light shining through it was the light of the earth; the same light that fell on the desolate lunar plains outside. Doubtlessly in the same manner, during the lunar day, the much brighter rays of the sun reached this buried valley.

Old Steve was gasping in sheer amazement. It was a great, natural hothouse that he had found, the one place on the moon where conditions were favorable for the development of even the most delicate of life-forms.

He directed the misty path of his flashlight against the riotous jungle of vegetation. Sweeping it onward, he saw a small, marshy lake, the inky surface of which was unruffled by the tiniest ripple. Standing in the water were hundreds of grotesque shapes, statuesquely motionless. Plant-men! Doubtless they were hibernating during the lunar night, absorbing moisture and mineral foods.

Old Steve was exultant. Impulsively, he drew his pistol, pointed its muzzle high over the lake. Garth had ruled those people by awing them. Why couldn't he do the same? Smiling, he returned the weapon to his holster. Such things could wait.

Beside the lake he saw a group of tall, cactiform plants, the pulpy stems of which were bright purple. The sight of them brought back to his mind the needs of his two companions. What had Garth written in that last page of his notebook? "The raw juice of the purple plants applied to the affected parts, and if possible, injected in *very minute quantities* into the blood stream. The plant-men contract this same disease, and treat it in just this way, always successfully, if in time. I learned of the treatment too late . . . ."

Old Steve knew what to do. He would get the medicine kit . . . .

It was not until he turned that he noticed the dark bulk of the *Artemis*, the vessel that had brought the expedition to the moon, resting against the slope of a low hill. Garth had brought it there.

Some hours had passed. Steve Jubiston, Claire Melconne, and the professor were standing in the control room of the moon-ship. The professor was speaking: "We shall return to earth as soon as we can collect some of the interesting objects around us," he was saying. "They should cause quite a sensation. Then we'll bring a new and larger expedition back with us."

"How about Garth?" Claire demanded.

● Professor Melconne's voice became quieter. "We know about Garth and what happened to him," he said. "The same thing might have happened to any one of us, allowing perhaps for differences in temperament. Everything unsavory concerning him goes out of our log, and

(Continued on page 659)

(Illustration by Winter)

A tremendous detonation resulted. Fragments of stone flew around and a greyish-yellow dust whirled up. The prison was burst open.

GARFIELD'S INVENTION

By LEO AM BRUHL

Translated from the German by Francis M. Currier

● Here is another German story that we have imported and translated for the pleasure of our readers.

You have read stories featuring many kinds of rays—heat rays—death rays—disintegration rays—cosmic rays—X-rays—but in this tale we read of a brand new kind. We have never heard of anything even remotely similar to it.

This story is not to be taken seriously. It is written in a light vein, and is really a burlesque on a certain type of science fiction tale that you will readily recognize.

● With a curt gesture toward the haggard, ill-clad man who was sitting uneasily in the chair opposite, Careman explained: "Mr. Garfield has discovered something remarkable, Jefferson. It concerns a novelty in chemical engineering, which, if practical, will revolutionize the feeding of the entire world and will confront economists with totally new problems."

"To carry it out will require eighty million dollars," put in the haggard man in a rasping voice. His eyes flashed.

Careman wrote down a few figures and at the same time drummed on his desk with the fingers of his left hand. This drumming was actually two words, sent to Jefferson at lightning speed in the Morse code: "crazy" and "interesting."

"As you know, Jefferson," he continued, turning to his subordinate, "our concern is strong enough to finance this invention. Naturally, the matter must first be investigated. Now, Mr. Garfield tells me that the apparatus cannot be brought here. Therefore I must request you to accompany Mr. Garfield to his home at once, so that he may give you a practical demonstration of the matter."

Jefferson nodded his consent, though this was merely a matter of form, and secured his hat and coat. A moment later he was in the elevator with the inventor, traveling down from the forty-second story.

Down on the street stood a closed car. Garfield silently opened the door, and Jefferson climbed in. But right behind him the door slammed, and he noticed, to his surprise and even terror, that he was sitting in absolute darkness. To be sure, he knocked with his knuckles against the window and even struck it with his fist. What he encountered seemed rather steel plate than glass.

The car started off. Jefferson endeavored to open one of the doors, but his most violent exertions were unsuccessful. He was a prisoner.

At first it seemed to him that the car was going over a bridge, one of the four giant bridges spanning the East River. But then he lost all sense of direction and could do nothing but listen and wait until he should be released. The car went on and on, stopped short, and then continued.

Jefferson did not know how long he was *en route*. His watch had stopped by the time the motor was silent and the prison was opened.

"I beg your pardon!" Garfield greeted him with a poor attempt at an offhand manner. "You will readily comprehend that before closing our contract I cannot let you know where in New York I am concealing my invention. The best protection against spying is secrecy. But do not fear a second surprise. Afterward I shall myself take you straight to your home on Fifth Avenue."

"How do you know where I live?" asked Jefferson in surprise.

"Naturally I made ample inquiries about you beforehand, without necessarily believing everything I heard," replied Garfield.

"Nevertheless, I seem to enjoy your trust."

"Trust?" croaked Garfield scornfully. "Trust? I do not trust a living soul!"

Now for the first time, Jefferson sensed the proximity of danger. He asked himself under what conditions Garfield would let him out of the house again, after he had once initiated him into the mysteries of the invention. Would not Garfield, in his anxiety, suspect treachery?

● They went through a paved yard to the house in the rear. It was a two-story structure in very bad repair. Garfield unlocked a heavy wooden door, allowing Jefferson to enter and go up a few steps of narrow stairway.

Meanwhile, he fastened several bolts on the door and then rushed up the stairs past Jefferson. When he had reached the top, he turned with a comical, silly leap, like that of a tight-rope walker, faced his companion, and cried to him hoarsely, "Remain where you are, Mr. Jefferson! The upper part of the stairway is connected here and there with high-tension wires, likewise the entire hallway up here. Wait where you are until I have opened the armored door. Then come up quickly. But do not touch the banister! As long as the armored door is open, there is no current in the hallway. But after a half minute the door shuts automatically, so do not delay!"

All this increased Jefferson's conviction that Garfield must be insane. Only curiosity aided him in overcoming his inner resistance, to assume an indifferent expression, and to follow the overcautious inventor. With an effort, he suppressed his horror and entered the broad opening of the steel door. Immediately behind him it closed silently, in spite of its evidently great weight.

Garfield switched on a couple of lights on the ceiling. Silently, by a mere gesture, he gave his visitor permission to look about.

This is what Jefferson observed: a large room, some sixty feet long and equally wide; the floor, the walls, and the ceiling made of something resembling white tiles. At the sides were switches, levers, tubes, and scales, together with a few boxes painted white. In the middle, some thirty feet apart, were two steel blocks resembling immense boxes of safety matches laid on the striking surfaces. They were approximately fifteen feet high, and the sides toward the two men were some twenty-five feet long. That was all that Jefferson could see.

What a curious affair! What connection could there be between these steel blocks and the future feeding of the nations?

Garfield broke the silence by saying, "Of course the blocks are hollow! The armored walls enclose the entire apparatus of the invention. In the right-hand block is the sender, in the left-hand one the receiver. Between is nothing but air, ordinary air from outside. It comes in through the tiling, a porous building material which I invented.

"Whether the sender and receiver are a few yards apart, as they are here, or thousands of miles, does not matter to my invention. Whether air, mountains, houses, or electric or magnetic fields are between them, is equally indifferent. If I set up the receiving block in Paris, the reception will take place just as well as it does here now. Think of radio waves. Something like that."

"Then you have discovered a new kind of ray?" asked Jefferson with interest.

"What I have discovered," replied Garfield slowly, "I of course do not know, any more than anybody knows the real nature of electricity, gravity, or a thousand other things to which we give names. I merely see the success and effect of my discovery, but I cannot understand it or even explain its inner character."

"And how do your rays act?" asked Jefferson. "What do they transmit?"

Garfield looked at him searchingly for

a few seconds and then screamed at him, "Taste!—Mr. Jefferson—taste!"

Jefferson had trouble in suppressing a smile. Taste! That was new. It certainly had been new to Careman. An apparatus which was to transmit the sensations of taste by means of ether waves was something hitherto non-existent. Surely, after telephony, radio, and television, there would come tasting at a distance! Why shouldn't Garfield have invented it?

Jefferson felt himself taken by the coat-sleeve and urged sideways, so that he could look at the rear wall of the steel block which Garfield had called the sender.

Here, too, were mysterious switches, buttons, levers, screws, and cylindrical and disc-shaped scales. The most surprising feature was a row of bent funnels, at the height of the man's head, each being about three times as large as the mouthpiece of a telephone. The tubes of these funnels decreased in size and ran into the interior of the sending apparatus. The openings were downward, over simple glass dishes. The latter stood on a narrow shelf connected with the steel housing.

Garfield pulled out the nearest glass dish from under the row of funnels and held it out to Jefferson. "Just taste what is in it!" he demanded.

Jefferson dipped the tip of his finger into the whitish liquid which filled the dish and brought it to his tongue. "Sugar!" he cried.

Garfield nodded with an air of satisfaction and replaced the dish under the funnel.

"A simple sugar solution!" he explained in a professorial tone. "The next three glasses contain vinegar, extract of Peruvian bark, and the solution of common salt. There you have the four substances used in medical investigation of the sense of taste to test sensitivity to sweet, sour, bitter, and saline flavors.

"And how do you feel the sensation of taste, Mr. Jefferson? Why do you taste with your tongue? Well, the substance you take into your mouth dissolves into a liquid which penetrates the taste pits of your tongue. There, according to its nature, it excites the so-called taste buds, very complicated systems of nerve cells, which then transmit the taste concept by means of nerve channels to the corresponding central point of the brain. That is how it happens. Why it happens thus and what law governs it, whether chemical or otherwise, we do not know.

"Therefore, in order to taste, very small particles or molecules of the substance to be tasted must be brought in contact with the taste buds. If, for example, it were possible to divide any substance so finely that the very tiny molecules could be transmitted by means of some kind of radiant energy, then one could transmit taste at a distance.

"In short, Mr. Jefferson, I have succeeded in making so fine a chemical division of all substances that their very tiny particles can be carried along by a certain newly discovered kind of ray, being 'dusted,' as it were, into any desired direction."

Garfield cautiously reached into the apparatus and moved a few levers. A gentle humming commenced inside the block.

"Come to the receiver, Mr. Jefferson," said Garfield quietly, now quite absorbed in his work.

They walked between the two blocks, where nothing could be observed to suggest the presence of any kind of radiation. Garfield went around the second steel block and drew the official of the banking house along by the coat sleeve.

The front of the receiver, to Jefferson's amazement, proved to be a polished wall, with a bluish tinge, unbroken by any lever or button.

Garfield pointed to it and said in a mocking tone, "Behind this wall is hidden the greatest secret of my invention. Accordingly I have mounted everything pertaining to the apparatus in the inside. Anyway, it would be aside from the point to show you all the details. But now you shall make a personal test of the result."

Garfield pointed to a small table, which stood close to the tiled wall and had a white covering. On it was a simple soup tureen of cheap porcelain and beside it

a plate, in which lay a small spoon. Garfield took out a camp stool from under the table, set it up, and invited his guest to sit down.

It was only when Jefferson had been seated that he noticed some white buttons, like those of electric doorbells, set in the tiled wall above the table. There were twenty or thirty of such buttons, each marked with a number, arranged in several rows.

"The human body," said Garfield, continuing his explanation, "requires for its maintenance a continual supply of all the substances of which it consists. It receives them in daily food—water, carbon, ammonia, lime, phosphorus, salts, and metals. But there is no ideal food. I mean such a one as would contain only substances which can be fully and entirely absorbed by the body and are not poisonous to it. A great part of our food, as we call it, is cast out, since it is useless. Another part is directly injurious to the body.

"Therefore, I have produced a mixture which is one hundred per cent serviceable for building up the human body and is absorbed to the extent of one hundred per cent. It contains no decomposition poisons and is therefore an ideal food in the true sense of the word. This soup-like mixture is tasteless. Try it, if you please, Mr. Jefferson!"

● Garfield lifted the cover of the tureen and ladeled on to the plate part of the contents, a gray slimy mass. Unwillingly, Jefferson placed upon his tongue a particle of the strange ideal food. It had no taste.

"Absolutely tasteless, isn't it?" went on Garfield. And when he noticed that Jefferson was shuddering with horror, he added, "Oh, do not believe that I am crazy and trying to poison you!"

Jefferson swallowed as though he had a pound of the substance to get down.

With satisfaction, Garfield slapped him on the shoulder and said, "Now just press button number one up there above the table. That corresponds to the first glass dish over at the sender.—But first," he remarked, "I will warm up my unit soup a bit for you, so that it will look more appetizing."

He seized the plate, took a couple of steps over to the side, and turned up a small gas flame which was glimmering there. He held the mixture over it for a moment and then set the plate down again before Jefferson.

Meanwhile, the latter had pressed the white button which was marked with the number one, but he had not noticed anything remarkable.

"Eat, Mr. Jefferson!" said Garfield.

Jefferson overcame his repulsion and ate. Garfield's unit soup tasted sweet. Jefferson tried buttons two, three, and four. In turn, the soup tasted, sour, bitter, and salty.

"Marvelous!" said Jefferson, honestly amazed.

"It was the slightest kind of test, Mr. Jefferson," remarked Garfield. "If I put caviar instead of sugar in the first glass dish, then by pressing number one, you could for hours eat soup tasting just like caviar, while the real caviar over in the dish would suffer no perceptible loss in volume."

"And you think that the future feeding of the world—"

"The simplest thing imaginable!" interrupted Garfield eagerly. "People will simply take a healthful, non-poisonous ideal food and will make it taste the way they like it."

Jefferson considered the remarkable invention and weighed matters pro and con.

"Isn't my invention worth eighty million dollars?" said Garfield suddenly, and his eyes flashed again. Jefferson could not help thinking of the protected stairway, the automatic steel door, and the dark automobile which had brought him here.

"What your invention is worth, I cannot decide," said he evasively. "I can only report to Mr. Careman and the board of directors."

Garfield laughed shrilly. "My dear fellow, do you know that you will not leave this room until I have the agreement with

the Bankers' Trust in my pocket? Make your report right here with me! For all I care, you may include the fact that Mr. Jefferson will return safe and sound only if the invention is purchased. It would be a fine piece of business for me to take you home now and have a dozen spies after me."

Jefferson calmed himself with an effort and asked, "Didn't you say that you would conduct me home personally?"

"Gladly, Mr. Jefferson—as soon as you, as representative of your bank, give me eighty million dollars!"

Silently, Jefferson reflected what he should do. Whatever the merits of the invention, Garfield was certainly insane. To be sure, Jefferson could sign the desired contract. It would be doubly invalid, because Jefferson did not have full power, and because it would be a forced signature.

Nevertheless, he wanted to see how this mysterious episode would turn out, in case he did not yield to Garfield's demand. He justly assured himself that he could always sign, in order to gain his liberty.

"Are you going to buy my invention, Mr. Jefferson?" demanded Garfield.

"No!"

"I will give you two days to think it over." There was a mad scream in Garfield's tone. "You will not leave this room. There is enough to eat in the tureen. Prepare your soup the way you like it, sweet or sour. At present, I have no other taste supplies here. And when you have decided otherwise, ring for me! There is the bell, over by the steel door."

● Garfield looked around, as though seeking something. Then he made a gesture, as though he recalled something he had forgotten. He walked around the steel boxes, paused as though undecided, and went on.

There was a moment of absolute silence. It was strange. Jefferson started up and went diagonally across the room. The inventer had vanished without a trace. He had gone through some secret exit which was now invisible again.

Hour after hour passed. Jefferson walked about like a wild beast imprisoned in a cage. He looked at the levers and switches, the tubes and scales. But he did not venture to touch anything, because he feared that touching the wrong mechanism might perhaps blow up the whole house.

Again he reflected. Should he sign or not? What would Careman say? After all, it was a question of his position, which he had attained with difficulty. What should he do? What should he do?

He rattled the steel door and turned the inner lock. In vain. There were no windows. Escape was unthinkable.

Cold air came in through the walls and gradually chilled Jefferson. Outside, it must have become night. Then there suddenly came to him the spark of an idea. Of course, of course! It would have to succeed! That was the way to regain his freedom.

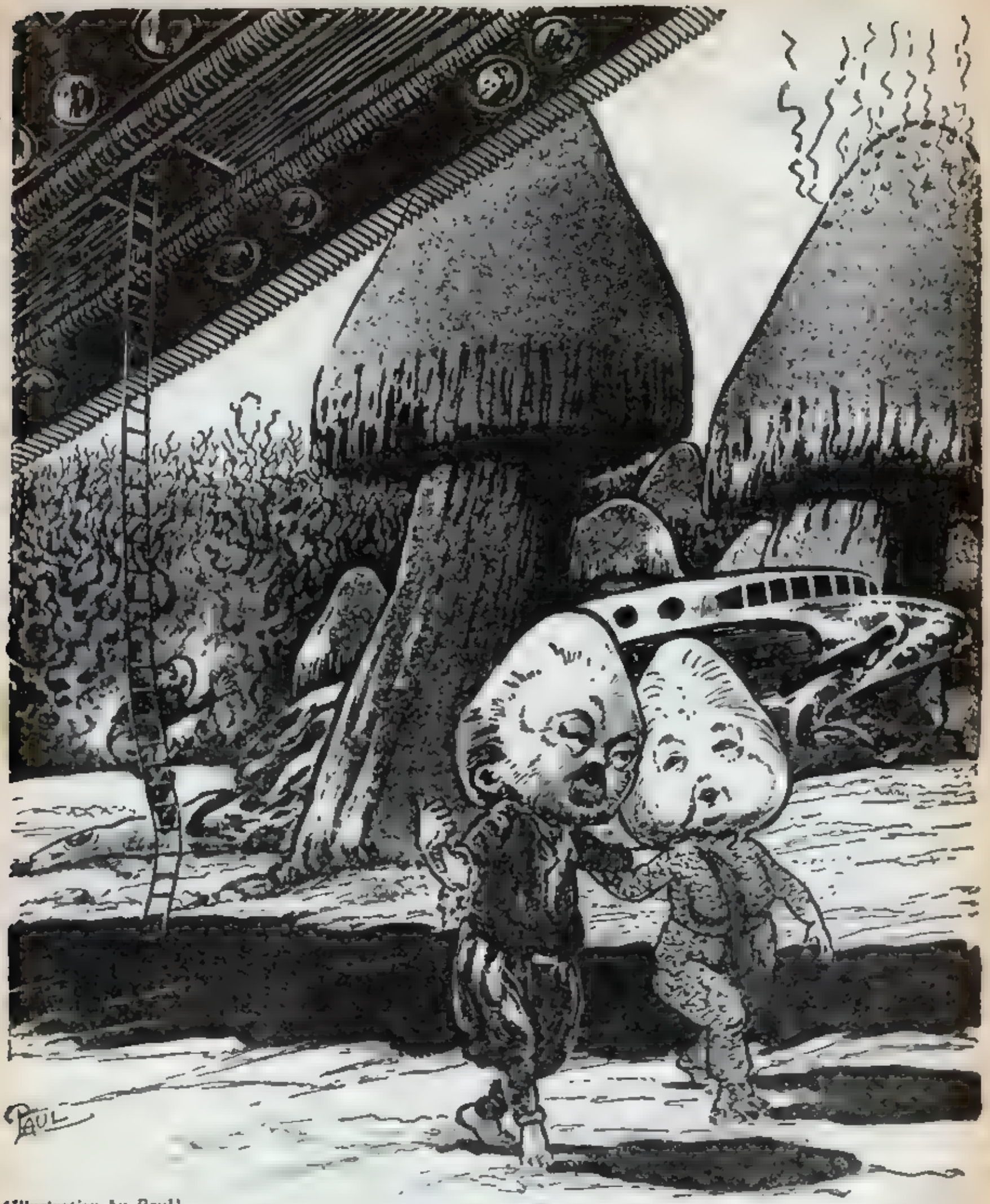
He had found it! He would escape his dungeon in a way which would have delighted the oldest professional escapers. He already had the implement in his hand, an unused lead pipe about twelve feet long, in one end of which he stuffed his pocket handkerchief. He unscrewed the burner of a little gas heater from the connecting tube, turned on the gas, and pressed the end of the rubber tube firmly against the white tiled wall.

If this building material, which Garfield said he had invented, let air pass through, as the inventor had asserted and as Jefferson himself had noticed from the cold which came in, then it would have to let illuminating gas pass through. What was more, it would absorb the gas.

In fact, Jefferson's calculation seemed to be justified. Though he pressed the gas tube firmly against the wall, after a quarter of an hour an intense odor of gas was already spreading at the place where he was standing.

Now he quickly dug a little hole in a joint with his pocket knife, lighted his handkerchief at the end of the long pipe, and went for safety behind the receiving block. Then he pressed the smoldering

(Continued on page 660)



(Illustration by Paul)

I pleaded and cajoled, but Gade chose to remain on the satellite of evolution with the girl, Nadia.

EVOLUTION SATELLITE

By
J. HARVEY HAGGARD

PART TWO: Conclusion

● Here is the thrilling conclusion to Mr. Haggard's greatest contribution to science-fiction. Perhaps the outstanding feature about this story is its lack of the almost inevitable happy ending. You will not realize the supreme horror of "Evolution Satellite" until the last page. In his concluding paragraphs, Mr. Haggard presents a dramatic and forceful ending—one that will linger in your memory and will make you want to re-read this tale many times.

This is perhaps one of the most original stories we have published in many months.

WHAT HAS GONE BEFORE

● Because of the mysterious disappearance of several space-ships which were bound from the earth to Neptune, "Bob" and "Gade," two captains in the Earth-Guard, are sent to investigate the space-lane. While passing Uranus, Bob gets the idea that the trouble may lie within the secrets of Satellite Number One of Uranus. Upon approaching this world, they notice that it is covered with the densest of jungles, composed of innumerable plants with no two alike. While entranced and nearly hypnotized by the unparalleled beauty of this exotic moon, a monstrous, tentacled plant reaches up to the space-ship and drags it into its carnivorous maw. The two men burn their way out and escape. They discover that everything on the planet evolves instantly to agree with its environment which immediately surrounds it. They meet a girl, whom they rescue from a couple of savages. While on watch the following night, Bob is attacked by a jungle monster, and Gade and Nadia, the girl, escape. By using his ray-gun, Bob escapes only to be captured by a predatory plant of gigantic size. He loses consciousness. NOW GO ON WITH THE STORY.

CHAPTER V
The Rescue from Space

● My first waking thought was to wonder how it was that I was still alive. I lay flat on my back in a little glade about which the jungle wall formed an amphitheater. Standing above me, and looking down upon me, was one of the most magnificent man-like beings that I have ever seen.

His body was erect and supple, devoid of clothing, yet covered in segmented shell-like armor. Surmounting his neck was a head of splendid proportions, observing me calmly from gray eyes.

The forehead, white and untanned, was broad and intelligent. A strong flaring nose jutted over a determined mouth. The great cranium which bulged up from his forehead was hairless, but covered with a close-fitting covering of horny segments.

If at first thought, I assumed him to be human, my next glance denied the supposition. Instead of arms, there extended long sinuous tentacles, ending in flat circular sucker-disks. His legs, though spindly and weak, were human-like. My gaze fastened to the feet. Four toes, connected by filmy webs! Like Nadia's; like the feet of the creature whose tracks we had followed.

I struggled to arise, but found myself weak and exhausted. At this attempt, the creature solicitously motioned me to relax and rest.

That was my introduction to Zakohr. He it was who brought me sustaining foods from the jungle and fed me while I lay convalescing. Of his speech I knew not a word, nor did he know aught of mine. When I was strong enough, I talked to Zakohr in the sign language, in which he was very apt.

"Are you the creature whose steps led into the jungle wall?" I indicated by signs.

"Yes," returned Zakohr, making illuminative designs with his sucker-like hands. "I saw that you were following me, and so I went into the jungle."

Instantly, I expressed my astonishment at his ability to pass unscathed through the vegetative maze. Zakohr explained that there were certain animals with a very offensive odor whose meat was repulsive and indigestible to the plants of the jungle. These animals, he indicated, could pass unharmed through the jungle. The evolutive growth of the carnivorous plants did not bother to detain them. He, Zakohr, had long ago found out about this. A particle of skin from one of these animals who were immune, hung to a cord about his waist. The scent, emanating from this hide, deceived the jungle plants so that they left him unharmed.

Zakohr went on to show how he, who had hidden in the jungle at our approach into the clearing on the hilltop, had watched from cover. The monstrosity with which I had fought had scented Zakohr and was upon his spoor when it was attracted to the camp-fire's light. Zakohr had seen my battle with the monster; had seen it fling me into the jungle while it was in its death throes. To satiate his savage curiosity concerning the great power of the blue ray emitted from my ray-gun in my duel with the monster, he had immediately penetrated straight into the jungle, where he had withdrawn my body from the clinging branches that drew back at the offensive odor of the hide at his belt. Carrying me to the little forest glade, he had lain me upon the ground. Since then he had doctored me through a harassing fever.

My recovery was speedy. As soon as I was again ready to travel, I signified to Zakohr that we should find our way to the clearing where I had last seen Nadia and Gade. I had no accurate means of knowing exactly how much time had elapsed during my illness, and I was extremely anxious to rejoin them.

Plans for escape from this dread satellite were already beginning to formulate in my brain. If Zakohr could cross the jungle by the potent protective power of the odor which he bore, then why not Gade and I? Why could we not fight our way back to our space-ship and disentangle it from the jungle giant which held it tightly in its clasp? At the best, we might don space-suits to which degravite screens had been attached. We might then drift out into the space-trail between Earth and Neptune. There, if our luck held, a ship might encounter us. If one didn't, it would be the end. A chance in a thousand.

● We were not far from the clearing.

Zakohr, after hanging a strip of the redolently offensive hide from my belt, led the way. Even though no growths clutched at us to stop us, it was hard to force our way through the thick, matted jungle maze. At last, we pushed through into the clearing. My face must have fallen when I scanned its emptiness. Zakohr looked on in puzzlement while I vainly scrutinized the ground for traces.

The jungle man frowned contemplatively, and then uttered a questioning grunt. He touched me on the shoulder to attract my attention, then began to make signs with his sucker-disks.

"Look you for the two who were with you in the clearing?" he demanded.

"Yes," I returned. "Know you of them?"

"Indeed, yes. They took wings and vanished into the night!"

"Wings!" I pondered his signs, flapping his arms like wings. Then I understood. Gade and Nadia must have donned the floaters and escaped. No telling where they were by this time.

In the days that followed, I learned the jungle lore of the satellite from Zakohr. Although we kept up a frantic search for Gade and Nadia, we were forced to halt at times to find food in the jungle upon which to subsist. I learned to live upon edible roots and berries. Zakohr also made signs of many other things about his mother satellite. Some of the things he tried to convey to me were utterly lost. For instance, I could never

get any comprehensible answer as to where his people were or where he had come from.

It was also a source of constant worry to me that I did not gain weight after my illness. My limbs seemed frightfully skinny and fleshless. I became convinced that I had not totally recovered, after all.

A first intimation of the horrible revelation which I was soon to make came from the physical change which seemed to be constantly taking place in Zakohr. His head grew larger every day. It appeared to be of a crustaceous membrane, strangely fleshy in aspect. His body too was changing, dwindling into very small proportions. In vain did I try to ask him by signs for the meaning of it all. Though his signs were vehement, they conveyed absolutely nothing but mystification to me.

We searched up and down the coast, existing on edible tubers. One day I managed to down a moon-troll with a rock. I immediately suggested that the flesh might be edible.

Zakohr, of late, had been surly and vicious. Now he fell into an uncontrollable fit. Foaming at the mouth, he seized the body of the small animal and flung it far from him.

It was then that an illumination burst upon me. The evolution of the moon-troll was not complete with the dwarfed little gnome-like creature. The little beings evolved into higher forms, such as the beasts we had first found attacking Nadia, and even Zakohr himself might have originated from one of the moon-trolls.

Heaven above—Nadia! Could it be possible? The realization flashed through me; my consternation grew. Could it be possible that Nadia had evolved from one of those fish-like beings which had crawled from the ocean?

Preposterous; and yet,—did it not explain many mysteries? Was not the evolution accelerated upon all of the living plants and animals which we had seen upon this strange satellite? Those fishy scales on Nadia's body; did they not signify a marine ancestry? Her incomprehensive speech, the absence of any clan of people of whom she might be an individual, her simple instinctive manners which might have been those of a forest animal; all this approbated the assumption that she had indeed arisen from the complete gamut of evolution. The longer I thought of it, the more complete the picture became; of the forms of life which evolved upward from the moon-trolls, changing, always changing in an adaptation to the vicissitudes of environment.

● I became frantic. Farther and farther along the beach we penetrated, looking everywhere for signs of the terrestrial and the satellite girl. Nadia—a beast! It was too horrible; the thought became unbearable; my waking hours were tortured. Sacrificing everything for speed, I moved along the shore in frantic haste.

Zakohr was beginning to object. He followed me now but hesitantly. He was getting slow and frowsy. His huge head looked sleepy and indolent. He loved to loiter along the beaches, to lie down on the warm sands and cover all of his body except the huge pear-like head with sand. The sight was vaguely disturbing.

In the end, I left him. I had learned to exist in the jungle. No longer was he necessary to me. Although I owed a debt to Zakohr, I could not hope to repay him by remaining at his side.

I began to find traces of Gade. A strip of metal-mesh cloth from his uniform, dangling from a rock; footprints; ashes of dead fires. I pursued the traces down the coast.

Always my mind raced endlessly in a train of revolving thoughts. Again there came that feeling of the menace of the satellite. Again was I warned of the dread individuality of this primary moon. Strange; strange it had been from the very first. Inexplicable because of its emanation of ex-Fraunhofer lines; incomprehensible with its evolutive monstrosities of animal and plant life.

I finally found Gade. Need I tell of the arduous search? Those long days and nights when I pressed upon their elusive trail need not be enumerated. They are

of no vital interest. It only matters—that I eventually found them, Gade and Nadia.

I saw them standing beyond a huge mound-like obstruction in the sand. Forgetful of everything in my joy at seeing them, I raced forward.

"Gade!" I cried in exultation, tears of joy blurring my vision. "Gade, old boy. Gade!"

Then I brought up in a halt of sheer horror. Gade—Nadia. But how they had changed!

Gigantic pear-shaped heads lolling over dwindling bodies. Flaring nostrils; pinched dewlapped cheeks. I ran over to my old companion of the Space-Guard. That gigantic caricature of Gade, with the huge bulbing cranium puffing above his features—could it be Gade?

"Gade!" I cried unbelievingly. "What's happened, Gade?"

Then I received the supreme horror. In the dull glowing of the eyes turned toward me from that gigantic head, there was no vestige of sanity. The monstrosity threw back its head and uttered an eery series of ghastly laughs. Nadia too, huge-headed and unreal, joined in the laughter. Clinging to each other for support, they weaved drunkenly about, giving vent to hollow mirth that I cannot describe.

"Hu! Hu! Hu!" laughed Gade, lurching a bit and then steadying to point a wavering finger at my face. "One of us now, Bob! *Hu! Hu! Hu!* One of us!"

● I began to understand through a dim mist of horror which seemed to swim within my mentality. My trembling arms came up—felt for my head.

A gigantic caricature slid under the touch of my fingers. The huge head which was Nadia's rocked and teetered upon the grotesquely shrunken little body as she witnessed my incredulity. She tittered and gibbered in her beastly animal tongue. For some reason, she seemed to resent my intrusion. Hanging to Gade's arm, she tried to draw him away. Nadia!—a beast at the end of an evolutive scale! Would we, too—

"Gade! Gade!"

I must have screamed the words. I was pointing, finger outstretched stiffly toward the black mound-like mass beside which we were standing.

"Sphace-schip, Bob," came the words from the drooling, rocking mouth. "Sphace-schip!" Then he joined Nadia in a chorus of unearthly, derisive laughter.

It was the ruins of a great liner. A skeleton hull lay half-buried in the sand; rusty machinery lay in ruined heaps. It was one of the vessels, undoubtedly, over whose disappearance we had been sent to investigate. All around the ruins of the space-liner grew the gigantic mushrooms. Mushrooms! The mere sight was repulsive. And my eyes riveted, clung to one of the great growths which was sending its stream of spores into the air to spread out on the wings of the wind into the ocean, while my eyes widened and my mouth contorted, while my puny fists clenched and shook.

How my overwrought mentality ever bore through the horror of the next moment, I know not. I know only that I was crying, screaming. I know only that the universe itself seemed to reel; that I found myself upon my knees at the foot of a giant mushroom, tittering convulsive sobs of insanity which shook my frame.

My hands sought that rusty object, that strip of material clinging to which I had seen, lying about the base of the mushroom. Trembling as if from ague, my hands brought the object up into my swimming vision.

A belt buckle! A strip of leather!

Heaven above! I was afraid of the thought which struck me—afraid of even letting the idea creep into my consciousness. It was too incredible, too horribly monstrous!

A madman! Leaping in frenzy; running wildly around the bases of the mushrooms strewn about the ruins of the spaceship, a madman plying into the sand with grimy fingers. Mad. Yes, nothing else; as buttons, buckles, and rotted strips of human apparel came up into my hands.

At last I could understand the insanity

of that gibbering big-headed thing which had been Gade. At last I knew why sanity had departed from the thing which had once been my companion in space.

For those mushrooms—I hesitated to even think of it—had once been the passengers of that great liner! They had changed, had evolved, even as Gade and Nadia were changing — into gigantic mushrooms. Yes, even as I was changing!

I saw it all. Those first primary changes I thought to be the inuring of a terrestrial being to the conditions of an alien planet; really but the first manifestations of Evolution. The Satellite of Evolution! Where evolution was so accelerated as to be as rapid as growth itself!

Evolution! Life-spores, drifting to sea; evolving into creatures which crawled upon the sand. Then into moon-trolls, growing, ever growing. Then to Nadia!—to Zakohr, adapting their physical characteristics to any environment which might exist. The incredible beasts who had attacked Nadia, yes, even the gigantic monster adapted by evolution to live in the jungle's depths!—all these—had been molded by the gigantic hand of evolution by the environment surrounding each individual creature. Because each had an environment that differed, their physical characteristics differed. Each adapted to his own habitat.

But the evolutive cycle had not ended with the production of the man-like beings of the satellite. Nadia and Zakohr were in the last stages. I remembered Zakohr burying himself into the beach! And before me, the great mushrooms were throwing off life-spores into the wind.

A satellite of accelerated evolution! At last I understood. I remembered those damnable ex-Fraunhofer rays—emanated from some inconceivable substance in the core of the satellite. Rays of evolution they were, sweeping through the satellite's outer layers, submerging its life in a ray which caused constant adaptation to environment.

Suddenly, a shrill piercing whine rent the air. Transfixed, we three big-headed creatures listened attentively. The whine ran up the musical gamut, departed for a time into the wave length of the inaudible, then crashed with a roar like rumbling thunder.

I knew that sound. How often had I heard it before!—a space-ship decelerating through the upper atmosphere. I looked upward.

The Watchman

● Rescue—it was something for which I had dared not even hope. And yet it was inevitable that rescue would be attempted sometime. Our Space Commander—I knew him better than to fear that he would fail to send a rescue ship! But at last it had come; that was it overhead. That it would find us seemed almost impossible.

From a speck in the sky it grew to a great ovoid space-ship whose degravite screens glistened in the sun.

Can you imagine my emotions? I think perhaps that I will not have to attempt to explain. I was mad with joy. Horror and fear of the satellite were departing in the ecstasy of the knowledge that I would soon leave this nightmare world. But when I turned—

Gade and Nadia were slipping away across the clearing. I sprang after them.

"Gade!" I shouted joyfully, pointing up into the sky. "Gade! Let's go! Back to the earth, Gade! Back to the earth!"

But Gade had seen. A momentary sanity had appeared in his eyes. From the depths of his being reflected a vast turmoil. He pulled away.

"No, Bob!" said the gargoyle-headed monstrosity. "No. Never. I'm going to stay—with Nadia. It's in my blood, Bob."

"Blood!" I cried wildly. "Blood! Gade, you are of different blood! You are a man and she—a creature evolved from low beasts."

"No. We are the same," came the answer. "Creatures we both are, evolved from lower beasts. It is only that the change is slower upon earth. In the end, we are both the same, Bob. Only the speed of the change is different! I love her."

I pleaded and cajoled. I don't know what I said. Perhaps it was meaningless babble. Perhaps it was the incoherent chortling of a maniac, but Gade did not hear. He was gone when the space-ship lowered a flexible ladder down to the frenzied man-creature on the beach. Gone back to the primeval wilderness of a satellite of evolution, gone because his love welded him to Nadia, the girl of the dread satellite.

* * *

● It was only one year ago that young Bob Mobart disappeared; one year, and it seems like an age. He was young then, a supple and erect figure in his immaculate uniform of silver-mesh, with the shining brass buttons on his breast and the rocket and shooting-star insignia gleaming from his collar. A space-captain; yes, even the words are enough to cause the eager blood of venturous fancy to go gushing into one's veins, the breath to shorten and the spine to tingle as the breath of romance passes quickly by, leaving straying romantic visions of the strange dangers of far-off astral bodies. One of those slim uniformed figures he was, who walk so fearlessly down the crowded moving streetways, before whose tread a path opens from the lolling crowd speeding along the ways; men glancing enviously as they pause to look at the trim figure and then darting quick fearful scrutinies of the fair companions who might be hanging back on their arms, red lips gasping and eyes wide with adoration as they watch the young figure disappear down that mysteriously opening lane into the crowd which rides the moving ways.

Yes, Bob Mobart was one of them then, a year ago. Now he has gone; and in the shadows of the great Rocket-Yard of the Space-Guard Building at night, when the silvery moon slips up to the top of a star-sprinkled sky to peer down over the dark-looming bulk of the barracks which surround the rocket-yard; when the satellite's glow etches the aisles of monstrous silent rockets pointing up in ponderous vigilance from steel-skeletoned cradles snuggling the dark earth; then there is a dark shambling figure which moves restlessly in and about the darker shadows about the rockets' bases—the watchman.

His figure is wizened and spindly. A bulbous head, huge beyond the proportions of his small figure, peers about with nervous, distorted eyes. Aged eyes, from a wizened tiny face at the base of a gigantic caricature-like cranium, bald except for a few sparse wisps of white hair clinging above the ears.

And if one were present when chance laughter floated out from the windows whose illumination checkered the dark surrounding barracks and the watchman happened to be in the moonlight, much amazement might be derived from the queer old watchman's actions.

He would halt; his tiny hands would knot into wrinkled fists as he would bite his thin dried lips and close his wrinkled lids over his eyes in anguish. Perhaps he would groan as he opened his eyes and spun to confront the source of the merry revelry. His eyes, torn with pain, would stare up at those windows in unutterable suffering. There was Youth, up there, Youth and its carefree happiness which once lost can never be regained.

But—those eyes! Peering from the face of that Gargantuan skull. They are gray. Strange, those eyes, strange that they are like the eyes of Bob Mobart who disappeared a year ago. Yes, the same steely gray, changed perhaps by age, but the same eyes which had looked forth dauntlessly from the strong visage of the young space-flyer who will soon be completely forgotten.

● Then that watchman would curse bitterly and raise his torture-laden stare into the firmament above. He would blast with bitter vehemence the creator of a certain tiny satellite which among others circles a distant outer planet. For long moments he would stand, strained with inward seething horror, unutterable hate unleashing from his tiny wizened face into far distant space above.

In those moments in which primal pas-

sions tore his body in all their fury, he would be mad, mad in a starkness which differs from insanity, mad from a fate which had robbed him of man's dearest possessions in life. Then, finally he would relax, and go bitterly on his rounds.

I know. I am that watchman.

I was Bob Mobart. There are times when I wish that I too had stayed up on the shores of that sinister evolutive satellite, to the end with Gade—and with Nadia.

THE END

OUR NEW POLICY

SINCE we have returned to the small size, we have changed our editorial policy. We hope that you have noticed this.

Have you observed that, for the most part, we have been avoiding time-worn plots and themes? Not only this, but we have demanded that our authors include good, logical, and accurate science in their stories, although not enough to become boring to those readers who are not primarily interested in the technicalities of the science. We have insiated that the stories be composed in such a way that they are not only refreshing because of their originality, but are convincing due to their plausible action and science.

Such grey-haired ideas as reducing the characters' sizes by rays until they can walk about on electrons; repelling invaders from other worlds or dimensions (especially Martians!); travelling into the future and barely escaping from the hordes of savages or hostile inhabitants that are yet to be born; planets warring with terrible rays against each other;—we could go on for pages with others that all dyed-in-the-wool science-fiction fans are familiar with—these plots we are trying hard to avoid.

If you read a story in our magazine that tastes old-fashioned and is reminiscent of the old days of premature and adolescent science-fiction, there are but two reasons for its appearance in our pages: (1) the story contains so many unusual and absorbing incidents that the time-worn plot is held subordinate and can be overlooked, or (2) the editors (who are only human) have slipped up. If we do slip up, we want you to remind us of it. That's what the READER SPEAKS is for. The more you remind us of such things, the more conscious we will be of our mistakes, and the more careful we will be in the future.

Just look over the issues of WONDER STORIES since it has returned to the small size, and see how many stories you find that were not NEW. Pick out those that were of the "just another story" type. We do not say that you will not find any. But we believe that you will find fewer of them than you have ever found through our pages before—in fact, through the pages of any science-fiction magazine.

Our authors are working harder now than ever—for they are starting to realize that we attach our choicest rejection slips to stories that are not NEW! This includes tales that we prefer to call old-fashioned. An old-fashioned story is one that would have been accepted without the slightest hesitation about five years ago—thrilling and interesting and scientific as it may be, it is still old-fashioned.

NEW plots; NEW theories; NEW action; NEW characterizations.

NOTICE this in the NEW WONDER STORIES. If you have been unable to understand why you have liked the last few issues better than preceding ones, we hope that we have settled that question.

WONDER STORIES is attempting a RADICAL REVOLUTION in science-fiction; and we hope that 1934 will be set down as the year of the GREAT CHANGE in scientific literature!

The Editors.

THE EXILE OF THE SKIES

By Richard Vaughan

(Continued from page 603)

"It works!" he cried. "But it is dangerous for us to be here. That beam of light is really an imprisoned magnetic field . . . . a magnetic field infinitely compressed. No wonder it is drawing our rocket-boat. In a few minutes, however, the sun will disappear and the beam will be automatically switched off. But I think that we had better leave the planetoid to its own devices for a while. The constant exposure of our organisms to the effects of the charged beam may have results we may not be able to cope with."

Nadja nodded acquiescence as she looked at the intensely luminous beam. "Why not explore Marinoe and Reinos? What do you say, Telzon?"

"The last two of the sister planets? It would be a good way to occupy the interval that must elapse before we see if Savary's experiment is a success or not."

The sun was touching the horizon. A vast relief swept through the bodies of the three living beings as it vanished, and the vital gleaming ray suddenly was no more. While Telzon and Savary berthed their little craft within the compartment reserved for it on the space-ship, Nadja walked into the glassite-domed observatory. Swinging her telescope across the blazing vault of the sky, she halted it at a ruddily glowing dot . . . . small Reinos rising in Speira's rear . . . . then at another palely gleaming pin-prick high above her head; Marinoe, last of the five sister planetoids spoken of by the ancients of Speira. An hour later, they were accelerating in space towards that delicate gleam.

(Continued next month)

Impressions of the Planets—Venus

By Richard F. Searight

I dreamed I stood upon a rockbound shore,
  Drenched by a ceaseless spume of bitter sprays
High flung from nameless seas beneath, which roar
  Against the ribbed fangs of stone always.

An acrid, sulphide fog hung close, and bound
  The shallow sea and spongy grey terrain;
The moaning breakers voiced the only sound
  To join the endless drip of falling rain.

A mist-wrapped world where life is yet to rise
  In dim and distant aeons far in Time,
When heat shall wane and clouds desert the skies,
  And destiny achieve its goal sublime.

THE MAN FROM ARIEL

By Donald A. Wollheim

(Continued from page 607)

pressed on this Earth being's mind the story of his voyage. Then, with a feeling of great satisfaction and glory at being the first to travel through space and set foot on another planet, he gave up the fight and crumpled to the ground.

* * *

● At this point, I awoke. I remembered the entire dream as if it had happened to me. Outside, the fog had lifted and I promptly set out in search of the spaceship. I found only a long track down the side of the mountain as if something rather like a huge football had rolled down. The track led directly into a deep lake at the bottom of the slope. Nothing had ever been recovered from this lake, and I gave up hope. I returned to where the track started. There by the boulder where the voyager had stood, was a tiny pile of dust, all that was left after the morning breeze had stirred it. Some of this I still have in a jar on a shelf over my fireplace. That is all there is left of the first space-traveller.

THE END

SCIENCE IN FICTION

(From The New York TIMES, *for Oct. 15, 1933.)*

Casting a critical eye on the wonder stories of science which he wrote at the turn of the century and of which eight are now republished in England, H. G. WELLS sniffs a little too contemptuously. It is true that great tales in any literature still hold attention because they reveal human character, because they deal with human joy and suffering in familiar situations, because in a word, they reflect life; and it is also true that the figures in a scientific romance serve merely to accelerate an action at the core of which lies some terrifying or curious laboratory discovery. Yet there is real art in the WELLS who eclipsed VERNE, an art which is as old as literature itself and which has had such exponents as APULEIUS, whose "Golden Ass" reflects a state in which Roman science was nearly all black magic; CYRANO DE BERGERAC, who anticipated VERNE in literary balloon ascents; SWIFT, whose "Gulliver's Travels" has as much science in it as ALDOUS HUXLEY'S satirical "Brave New World," and the host of Utopians who, like BELLAMY, picture a world in which button-pushing is the nearest that happy mankind comes to drudgery. Such stories as "The Time Machine" and "Food of the Gods" may have no relation to life, yet only a master of phrases and dramatic effects could make them so life-like and plausible as WELLS did. A man who can write of a voyage through time that "night follows day like the flapping of a wing" has something of the poet in him.

The VERNE formula is simple. Reveal how a machine works in its minutest detail. Introduce the calculations that prove how easy it is to shoot a man to the moon. Let the characters gush Facts that Every Boy Should Know. At that game a thousand newspaper reporters could beat VERNE. Not only did they prove his undoing, but they showed that the real science of the laboratory is more startling than that of fiction. X-rays, radium, wireless telegraphy, ultra-violet rays — VERNE learned of them through the press in his own lifetime. He never understood them, never grasped their possibilities, but kept on working the old formula that produced "Five Weeks in a Balloon" in the days of the Second Empire.

With WELLS there was a steady development. He was not only a trained scientist who graduated with honors, but a writer of creative imagination. Even in such early works as "The Wonderful Visit," "The Time Machine" and "The Island of Dr. Moreau" he speculated on the social consequences of science. It was not long before he realized the shallowness of the VERNE type of story. After all, what are discoveries for except to be applied in changing environment and advancing the human race? To voyage twenty thousand leagues under the sea and behold the wonders of the ocean bed may be exciting, but no more exciting than the happenings in any good story of adventure. But science as the means of shaping human destiny—there's a theme which is not only attuned to the age but which demands a knowledge of laboratory methods, history and politics if it is to be exploited with the skill of an artist and the fervor of a reformer. No wonder that the WELLS of "The Time Machine" has become a sociologist.

WHEN REPTILES RULED

By Duane N. Carroll

(Continued from page 621)

straight for the clearing, his attention was centered on her, and he seemed not to notice Lugi who had reached the open space and was racing across it. Suddenly his muscles tensed; Rayah was darting downward. Swiftly she came, straight for the fleeing Lugi. But swift as she was, Gunda was swifter. With a rush and a leap he shot his cruel claws up to meet her.

The air saurian, seeing the menacing claws, tried to avoid them. But she was too late. They clutched her in a viselike grip, pierced the flesh, and for a few moments the struggle was fierce. Screaming and hissing; fighting with every means she possessed, Rayah struggled to break the hold of her antagonist. Frenziedly, her great wings beat the air and the sharp teeth inflicted many a painful wound upon the head and neck of the tyrannosaurus. But her efforts were in vain. Gunda's hold could not be broken. He clung grimly to his struggling victim, waiting for an opening. Shortly his opportunity came. Rayah, nearly exhausted, ceased her struggles for a moment. In that instant, Gunda's great head darted forward; the powerful jaws opened and closed. There was a sickening crunch, and Rayah's wings drooped and fluttered about the body of her slayer. In a few moments, no evidence of the struggle remained.

While the two fierce reptiles were battling, Lugi had made good his escape. As though reluctant to relinquish what he had risked so much to procure, he had clung to the egg, which had miraculously escaped injury, all during his mad dash to escape the pterodactyl. He was now in a secluded spot, enjoying his hard-earned meal.

● Such was the Mesozoic: "the survival of the fittest." The hunter was hunted and the killer was, in turn, killed. Here had two reptiles procured their morning meal. Another reptile and her unhatched babe had furnished it.

THE END

WONDER STORIES *presents*

The cream of contemporary Science-Fiction. A few of the forthcoming tales are:

A VISIT TO VENUS by Festus Pragnell—acromegaly spreads over the face of the earth. Millions of normal people suddenly become horrible monstrosities. What is the cause of the sudden outbreak? Then comes the tremendous revelation!

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CHILDREN OF THE RAY by J. Harvey Haggard takes us down below the red spot of Jupiter where a shaft of blazing fire from the bowels of the greatest planet in the solar system is worshipped by a race of strange beings. And they throw themselves into its consuming depths in willing sacrifice.

Watch for these stories in the next few issues, among many others by the leading authors in the field.

WONDER STORIES—*ON ALL NEWSSTANDS*

MOON PLAGUE

By Raymond Z. Gallun

(Continued from page 641)

he shall receive full credit for everything he has accomplished here."

A fleeting, pained look crossed old Steve's rugged face, as he gazed out of a window at the eldrich-lighted landscape beyond. Jumbled things flitted through his mind. There was a brain-picture of a small, studious schoolboy, mounting butterflies in a picture-frame. That had been the Garth of long ago. Walker? Frank Walker was dead: murdered. Old Steve's heart was heavy. But he knew that the heaviness would not last long. The many interesting things he had to occupy his mind would soon make him forget. People were like that. Nature had made them that way. Nature was kind.

"Thanks a lot, Mr. Melconne," Steve said. "And now I think I'll take the flier and go up through the tunnel to the real outdoors. It's night there now. I want to land there some place and just walk for a few minutes. I want to feel the cold and see the craters under the earth shine. All by myself. I want—oh hell—such talk!"

THE END

The Riddle

By Al Browne

Nurtured in some Cosmic womb,
Cradled there in Stygian gloom,
Were we thrust upon our way
Thru a far-flung nebulae?

Life, a feeble, lingering spark,
Hurtling on in frigid dark,
Who can read that riddle, vast,
Count the monstrous suns we passed?

Questing to these fertile shores,
Did we drift, as dormant spores
Spawned by elemental clan?
Maybe that's how life began!

GARFIELD'S INVENTION

By Leo am Bruhl

(Continued from page 647)

flame into the tiled wall which was saturated with gas.

A tremendous detonation resulted. Fragments of stone flew around, and a grayish yellow dust whirled up. The prison was burst open.

Jefferson looked down at the street, which ran past the breach, nine feet below. It was just becoming morning. He sprang down, right into the middle of the excited crowd which had already assembled. He fell squarely into the arms of the policeman on duty in that section.

Just while he was in the act of telling the representative of the law and order about his adventure, Garfield appeared in the hole in the wall, dressed in tattered night clothes, his face distorted to a devilish expression.

His head moved back and forth, restless and searching. Out came one hand with claw-like fingers; then the other. He looked like a devil bestowing a blessing.

His voice screamed, "Death and the devil! Now you are all going to hell!" He disappeared.

If the policeman thus far had understood little or nothing, he now understood the danger threatening himself and the crowd, in case another and perhaps more violent explosion should occur. With his club, he managed to clear the street of people. Three minutes later, Garfield's house blew up into the air.

* * *

● Careman shook his head discontentedly, when he had heard Jefferson's report.

"Your escape, Jefferson," he said slowly and emphatically, "is a gallant deed which would have excited admiration over in Europe. But, to speak frankly, I should have liked it better if you had given the harmless signature and saved Garfield's invention. Now, after it is all destroyed, I should almost like to believe that tasting at a distance had been invented. Next time be more peaceful and think less complexly!"

● Then he had done wrong! In vexation and bitterness, Jefferson turned toward the door.

"Jefferson!"

"Yes, Mr. Careman?"

"Tomorrow go to 79 Ninety-third Street. A certain Samuel Beach lives there, who has also discovered new rays. With them, one can in a few seconds transform any amount of water into indestructible solids. Samuel Beach will change the Atlantic into a desert of cement. Just look into the matter, Jefferson!"

THE END

WHAT IS YOUR SCIENCE KNOWLEDGE?

Test Yourself by This Questionnaire

1. What is the name of the first moon of Uranus? (See Page 606)
2. What is the diameter of Ariel? (See Page 606)
3. Describe the sound track of a motion picture film. (See Page 611)
4. What are the shortest known rays? (See Page 613)
5. What are lichens? (See Page 627)
6. How does fungus differ from other plants? (See Page 627)
7. Why do scientists believe the moon is practically airless? (See Page 630)
8. How is the oxygen content of our atmosphere maintained? (See Page 630)
9. What causes the ringworm? (See Page 633)
10. What are the four substances used in medical investigation of the sense of taste, and what do they test? (See Page 645)
11. How do we taste? (See Page 645)
12. What substances does the human body receive in its food? (See Page 646)

Science Questions and Answers

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited, we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical, also, to print answers as soon as we receive questions. However, questions of general interest will receive careful attention.

THE ASSOCIATE SCIENCE EDITORS OF WONDER STORIES

are nationally-known educators, who pass upon the scientific principles of all stories.

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Curator, The American Museum of Natural History
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Acting Director, Psychological Clinic, University of Hawaii.

ZOOLOGY
Dr. Joseph G. Yoshioka
Yale University.

Relative Speeds

Editor, SCIENCE QUESTIONS AND ANSWERS:

I have two questions I've been wanting to pop at you for some time. One of them has been discussed in almost every issue of WONDER STORIES, but the other, as far as I know thus far, is my own idea.

First—About your cannon ball and express train problem. I agree that the cannon ball would attain a velocity of 120 m.p.h. (as in the example) if the gun were pointed in the same direction as the train. But here's my idea. You suggest that the cannon ball would not even leave the train, were the gun pointed in the opposite direction to that which the train was travelling. I have tried this out for myself, by shooting rubber bands from the backs of moving cars, and I find that the cannon ball would maintain its respective position to the ground, while the train would draw the gun from around it. Therefore, the velocity of the cannon ball exactly counteracts that of the train, and the ball moves neither forward nor backward, for there is no force to move it. Am I right?

Second—This one deals with velocities, too. Let us assume that a rocket ship is in free space, where there is nothing to diminish its speed. It is travelling at a rate of 1000 m.p.h. Each burst of its rockets is enough to speed it forward at a rate of 1000 m.p.h. Would not the speed of the ship increase by 1000 m.p.h. at every discharge of the rockets? There is nothing to hold it back, and each discharge would be adding another 1000 m. to the already attained velocity.

D. H. GRIMM,
Los Angeles, Calif.

(You are entirely correct in your idea of relative speeds. If you shot the rubber bands in the opposite direction to that in which the car was travelling, though at the same speed as the car, they would fall right to the ground, although the car would continue to travel. In the July, 1933, issue of "Everyday Science and Mechanics," this problem was taken up at length. The article gave the example of throwing an object across the aisle in a moving train. Although the object only seemed to jump a few feet, in reality, it also moved several yards forward while still in the air, although the observers did not realize this fact. It is all a matter of relativity. The object was moving in the train; the train was moving on the earth; the earth was moving around the sun; and the sun with all its planets was moving at a terrific speed around the center of the galaxy. If you stood on a flat-car and threw an object into the air, it would lose speed on its way down if you threw it high enough so that the friction of the air would impede its progress, and it would land some distance behind the point from which it was thrown, the distance depending on the length of time it was in the air.

In free space, each rocket discharge of a space-ship that speeds it forward at 1000 m.p.h would accelerate it that much, so that six equal discharges would increase the speed of the ship 6000 m.p.h. over its previous rate of travel. However, this idea is not practical except, perhaps, between galaxies or island universes where there are no heavenly bodies within many light-years, for each body tends to accelerate the ship toward that particular body because of its gravitational attraction. The sun would present the greatest attractive force in the solar system to overcome. This would necessitate the use of additional force or power to overcome this pull from the bodies of space.—EDITOR.)

Centrifugal Force and Gravity

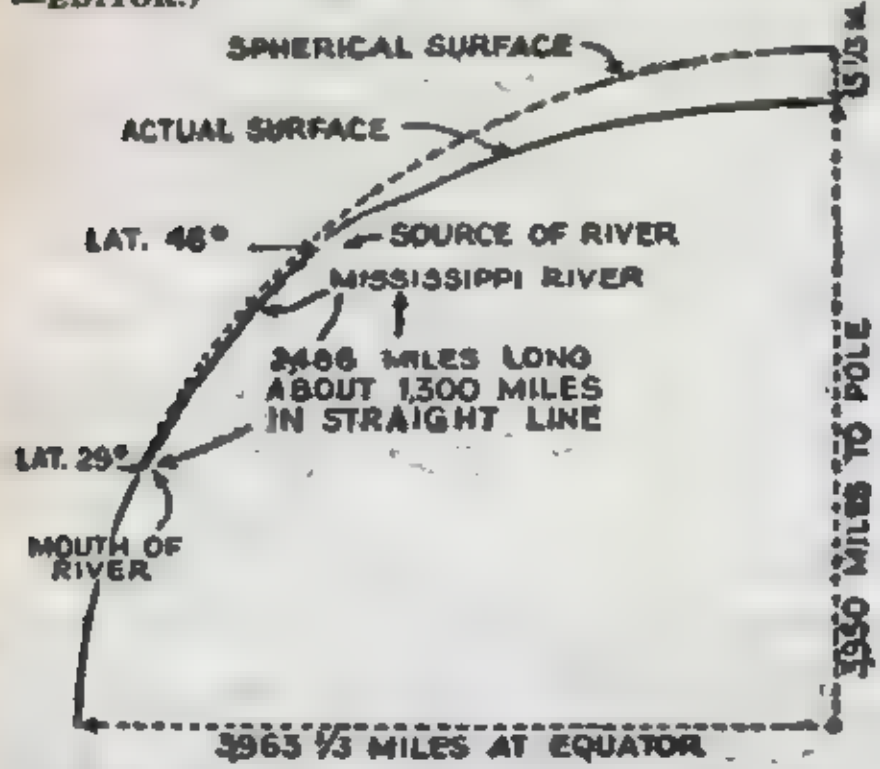
Editor, SCIENCE QUESTIONS AND ANSWERS:

Some time ago I read an editorial in a magazine of the same line as WONDER STORIES, the name of which just now I fail to remember. The editorial centered about gravitation, and it stated that the Mississippi River is higher at the point of origin than at its delta; in other words that it runs uphill propelled by gravitational force. I have been laughed at for making such a statement and being in your place, I feel that you are competent to enlighten me about the matter.

HENRY BIANOR,
Ouray, Calif.

(You misstate your facts. If the origin of the Mississippi River were higher than the delta, there would be no controversy on the subject, as all rivers run from the head to the mouth. We take it that you mean that the delta is farther from the center of the earth than is the origin, which is the case. You also state that it is propelled uphill by gravitational force. This is contradictory. Anything moving away from the center of the earth is moving against the force of gravity, as gravity pulls everything down.

If gravity were the only force acting upon the flow of the river, conditions would be decidedly different—but you must take centrifugal force into consideration. The centrifugal force tends to whirl things away from the earth, and is counteracted by gravity. This accounts for the Mississippi River flowing towards the equator, which is farther from the center of the earth than any other part of the globe. While gravity holds the river in its bed, centrifugal force (indirectly) causes it to flow in this direction. The earth has recently been termed a "geoid," because its surface (water-level) is not a true sphere or globe. It is flat at the poles, something like a tangerine, for example. —EDITOR.)



In the diagram above, the departure of the earth's shape from a sphere is greatly exaggerated; it corresponds actually to 1/132 of an inch, which would not be visible. Since the sea level of the earth, although not a sphere, is the level of equal gravitational pull, water flowing down toward the sea level obeys gravity, even though it may be getting farther away from the center of the earth, and closer to the theoretical enclosing sphere, which is shown in dotted lines in the figure. The sea level is bulged out at the Equator by the earth's centrifugal force, which is about half of one per cent of gravity.

Planets and Telescopes

Editor, SCIENCE QUESTIONS AND ANSWERS:

(a) Will you give me the estimated distance of each planet including the hypothetical Vulcan from the sun?

(b) Which are the inner planets? The outer? Are they judged by being closer to or farther from the sun than Earth?

(c) Where is the largest telescope yet made located?

VIRGINIA KIDD,
Catonsville, Md.

(A. The approximate distances of the known planets from the sun are as follows: Mercury, 37,-209,000; Venus, 65,100,000; Earth, 92,900,000; Mars, 139,400,000; Jupiter, 483,100,000; Saturn, 882,500,000; Uranus, 1,783,600,000; Neptune, 2,787,000,000; and Pluto, indefinite. The distance of the hypothetical Vulcan from the sun depends on who hypothecates it, as there is no proof of its existence. However, it is supposed to be about 14,500,000 miles from the sun, and that would make it pretty hot. This means that it should pass in front of the sun (that is, between the earth and the sun) about once in every twenty-two days. If the planet really existed, astronomers would be able to perceive it at least once in each revolution, and as this cannot be done, the most sensible conclusion is that there is no such world in existence.

B. The inner planets are Mercury, Venus, Earth, and Mars. The outer ones are Jupiter, Saturn, Uranus, Neptune, and Pluto. The asteroids, or planetoids, separate the inner planets from the outer ones. There is such a great distance between Jupiter and Mars, and between each of the outer planets, compared to the nearness to the sun of the four inner ones, and to each other, that this classification has been made.

C. The largest completed telescope in the world at the present time is the reflector at Mount Wilson Observatory, and has a 100-inch mirror. A 200-inch telescope is now being constructed, which should prove to penetrate about thirty times as much space as the one now at Mount Wilson.—EDITOR.)

Protons and Electrons

Editor, SCIENCE QUESTIONS AND ANSWERS:

My knowledge of science is very elementary, and I [illegible] shamefully admit that my idea of protons and electrons is a bit hazy. Would you kindly clear up this point in my mind by telling me the difference between the two?

ALFRED FRIEDLANDER,
Portland, Oregon.

(An atom is composed of protons and electrons. According to theory, protons are positive charges of electricity, and electrons are negative charges. The nucleus of the atom is composed of the protons, and about half the electrons. The remainder of the electrons revolve about the nucleus.—EDITOR.)

Atlantis

Editor, SCIENCE QUESTIONS AND ANSWERS:

Several of the readers of your magazine wish to know why scientists believe that there used to be a continent between America and Europe, called "Atlantis."

Please give a few general facts regarding the continent of Atlantis and its people.

LOUIS WAINS,
St. Louis, Mo.

(Not many scientists believe in the existence of Atlantis, for as one has definite proof of its existence. In fact, according to the October 14, 1933 issue of "Science News Letter," Prof. W. A. Heidel of Wesleyan University believes that it is a myth which was originally designed by Plato, and no previous records of it can be found. In one of his lectures, the philosopher Plato asked the audience to picture a great continent-island in the middle of the Atlantic engulfed by the ocean. He used this idea only to bring out some point in his speech, and it was not to be taken seriously. Some of the scholars exaggerated the idea and spread the word that the hypothetical Atlantis really had existed. From this, you can draw your own conclusions as to whether this land ever was, and even if the idea is a myth which has sprung from the writings of Plato, it is still not impossible to believe that a continent really did exist in the Atlantic, and while scientists can not as yet prove that there was such, neither can they disprove it.—EDITOR.)

The Brightness of the Planets

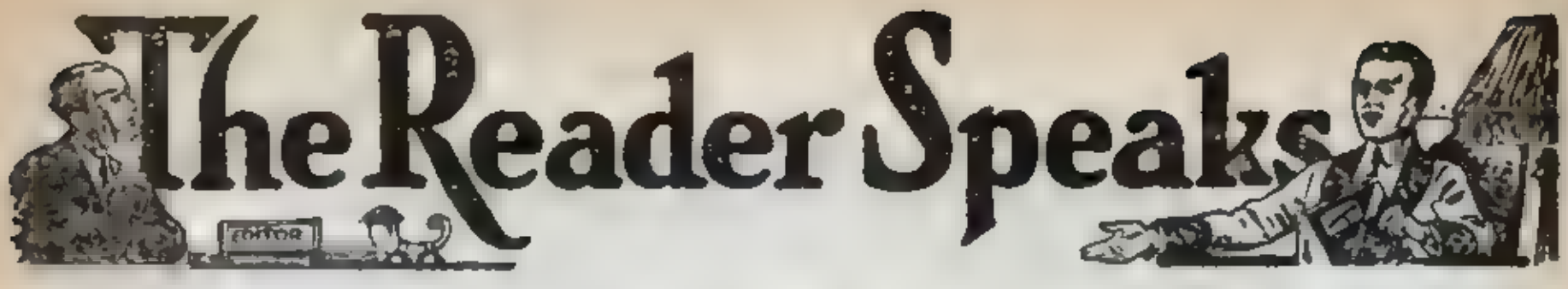
Editor, SCIENCE QUESTIONS AND ANSWERS:

Heretofore I have been a silent reader of "our mag," but a question arises. Mars is 142,000,000 miles from the sun, while Jupiter is 483,000,000, almost four times the distance of Mars from the sun. How does it happen that Jupiter has a brighter light than Mars and yet Mars receives more light and ought to reflect more light? Can you relieve me in your excellent "Questions and Answers" department?

GORDON A. EMM,
St. Louis, Mo.

(Jupiter is brighter in the sky than Mars for many reasons. In the first place, while it receives only about one-ninth the light from the sun that Mars does, it presents about 440 times as much surface for reflection, which would make it about fifty times as bright. Then, considering that the planet Jupiter has a greater reflective power than Mars, at least twice as much, we find that Jupiter is really much more than one hundred times as bright as Mars; and at that, Jupiter is at times almost twenty times as far from the Earth as Mars is.—EDITOR.)

(Continued on page 666)



IN this department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good, old-fashioned brickbat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps, to cover time and postage, is remitted.

A Very Interesting Letter

Editor, WONDER STORIES:

I am very happy to see WONDER STORIES changed again to the small size. Instead of wondering when I'll get a chance to read it (for I work during the day and attend school at night—and always at bedtime I am too tired to read) all I have to do now is drop the magazine snugly into my coat pocket every work-day morning to open it on the train, once I've looked through the newspaper; in the evening the process is quite similar. I never did this with the large-sized ones.

The attractive cover of the November issue depicts most remarkably the superb ability of its creator, Frank Paul, whose work, by the way, is becoming less fantastic and more convincing, as well as within the bounds of reason. But I hate to see him have to draw an insensible picture like the one which appeared on the May, 1933 cover. I hope the editors try their best to avoid such absurd means for arousing wonder in those not acquainted with our mag.—I guess that is about all it can do. I note also the much improved lifelikeness in the faces of characters drawn by Mr. Paul.

Mr. Gernsback's editorial has shocked me. Poor old Mars must be *pretty* old after all. Shrunken in mass, almost no water left, scant atmosphere, precious oxygen! It spurred me into reflection. What of the canals? Undoubtedly they are the work of intelligent beings, yet how can an intelligence thrive in comfort under these harassing conditions? I sought a clue to the answer and found both. Clue: the canals (as always). Answer: they are not canals but some other super-structures which may account for everything . . . .

Now I must explain myself. First of all I got to wondering how the canals can still remain visible with all that dust flying around on the planet (as many astronomers maintain). Surely in the course of ages the waterways could have become clogged up with dust and what-not due to wind and sand storms. However, such does not seem to be the case. To the contrary the "canals" are visible as though climatic forces never have succeeded in changing their aspect. Therefore I arrived at the conclusion that they cannot be there for irrigation purposes. Even her thin atmosphere is against any such enterprise. Now, I asked myself, what *can* they be?—or still, why are they seen as dark, geometric streaks? Do they drop far below the surface, thus causing their shadowy appearance? Ah! here was something to work on . . . . Perhaps their depth runs into miles—extending so far into the crust of the planet *that atmospheric conditions on their bottoms are like those which prevail on the surface of the earth!* Not bad, what? Perhaps this is what the Martians did as a last resort to continue to thrive. They must be old chaps anyway, and not caring much to see the sun and stars. Green plants for food? I doubt it. Vegetation on Mars must act solely as an agent for purifying the air—that is, the taking in of carbon dioxide and the giving off of oxygen. Then what do they do about securing the essential elements of nutrition? Very simple: Synthesis by chemical means. This must be their chief industry.

I believe that when the first successful voyage to Mars is made, the voyagers will return with the sad news that the red planet is the abode of a dying race and must be untampered with.

"The Lunar Consul" is a Sax Rohmer type of story, at least so far as the first part goes. It keeps your undivided interest up to the last page. I hope the final installment is just as enjoyable as the first. Who is the Lunar Consul; what was his purpose in going through all that trouble creating the gigantic markings on the moon; is he really doing it all "for the good of Mankind"?

A few pages of a neat little yarn like "The End of Tyme" every month to amuse the readers would be a great idea, I think.

I did not like Perry's "Death Between the Planets." The whole story seemed absurd to me, not plausible. A one-man projectile is shot into space with no predestined course or goal and after its involuntary human burden regains consciousness, the effects of the needle injection having passed, remains so for a short time, then lapses into unconsciousness again, he suddenly finds himself stranded on the planet Mars! A few hours of space travel took him across millions of miles of space! The story as a whole was not bad, but the science—*terrible!* Are those "small tracks or paths about two feet wide that glint like steel . . . . very smooth and glistening, and laid in undeviating lines for miles and miles, except where there were wide curves joining into other tracks that crossed or ran parallel" supposed to represent the Martian canals? God—oh, God! Two feet wide! In Paul's illustration he made the sun too large for an outer planet.

I found "The Tomb From Beyond" unusual, instructive and full of imagination. I enjoyed it very much. Although Mr. Jacobi's style of writing is mild, his present tale thoroughly deserves its place in WONDER STORIES. More from this author, if you please.

Naturally, Laurence Manning's "The Call of the Mech-Men" is the prize story of the November issue. A story worth re-reading is correct, Mr. Editor. "The Man With X-Ray Eyes" was deucedly interesting, but I think Hamilton could do much better. His old inter-planetary tales were superb; they literally were soaked through and through with the juice of unparalleled imagination. Those were *stories;* his recent contributions seem like "tripe" as compared to his old ones. How about another like the "Hidden World"? or "Universe Wreckers" which appeared in a competing magazine a few years ago? "Through the Einstein Line" is the last story and believe me the last is right, if you don't tell your authors to avoid this kind. It sounded more like a fairy-tale than a science-fiction tale. True the idea in back of the story was good, but it fell into the wrong hands. Jack Williamson ought to have taken care of an idea of this sort.

Ever so meekly now, I end with a whisper, oh—so low and gentle a whisper—"How about a Science News of the Month column?" If not, why not?

MORRIS MILLER.
Brooklyn, New York.

(We agree with you that the change in size of the magazine was all for the best. As you say, it is easier to handle and can now be read on the way to work with ease. This is not the only advantage of pulp size.

You seem to like our covers, like the majority of our readers, but there are a few who claim that they

(Continued on page 666)

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SCIENCE QUESTIONS AND ANSWERS

(Continued from page 662)

Origin of Species

Editor, SCIENCE QUESTIONS AND ANSWERS:

I have found much food for thought in Darwin's "Origin of Species," especially where he said that man has descended from the ape. Does that mean that the apes that are living today will have human descendants in a million years or so? If this is the case, what will the creatures that are men today look like at that time?

RICHARD SEMMELL,
Atlanta, Georgia.

(Darwin never said that man descended from the ape. In his book published over seventy years ago, "Origin of Species", he states that man and the ape have a common ancestor. This means that sometime in the dim past, there was one biped which branched off into two lines of evolution. Say, for instance, that one tribe of this creature, through some incomprehensible means, developed into human beings (or rather, their distant descendants), while the rest of the creatures developed into what we now call the ape. You can liken this procedure to the branches of a tree. At one time, there was no life on the earth except the most primitive form, the amoeba, or protozoa (one-celled). This creature, the simplest form of life that can exist, through many, many millions of years, and maybe billions, eventually evolved into every creature on the surface of the earth, branching off at various intervals. One of these branches, the vertebrates, finally produced man, apes, dogs, cats, cattle, and every other living thing with a backbone. The present apes may evolve into reasoning beings some day with the intelligence of the human of this age. No one can predict what the human being will have become by that time, as we are now the highest form of life upon the surface of the earth. Conjecture on this subject has produced several excellent stories of science-fiction.—EDITOR.)

THE READER SPEAKS

(Continued from page 661)

are too "gaudy" or "loud." We do not deny the fact, but we do say that it is necessary in order to have a newsstand sale. These covers are very attractive and draw the eye of passers-by, who may be persuaded to buy the magazine because of this fact, and thereby we acquire many new faithful science-fiction fans who would not now be acquainted with the magazine if it weren't for this. If we took a vote, we'd probably find that a large percentage of our readers were introduced to science-fiction by the cover of WONDER [redacted]

Your idea as to the nature of the canals of Mars is indeed interesting and very plausible—much more plausible than some theories we have heard. No one has yet proven that these canals contain water, and your conjecture would make a good subject for a science-fiction story. Some author may take the hint.

We cannot see that your criticism of "Death Between the Planets" is justified. It seemed plausible to us, and we could find no outstanding scientific fault in it. Most of our readers seemed to have enjoyed this story immensely. However, no story can ever be written that will please everybody.

If we receive enough complaints about the type of story as "Through the Einstein Line," we will cease to publish them. Tell us how you like Haggard's "Evolution Satellite."

WONDER STORIES is primarily a fiction magazine, and we discontinued the *Science News of the Month* because too many of our readers objected to it. If you are interested in current science, you should read our sister magazine, EVERYDAY SCIENCE AND MECHANICS. The articles in this magazine are not cold-blooded, but are written in a very interesting way, and are lavishly illustrated. It is amazing how many of our readers also read EVERYDAY SCIENCE AND MECHANICS. It seems to be composed in a style that is especially attractive to the science-fiction fan.—EDITOR.)

The Scienceers

Editor, WONDER STORIES:

Would you be kind enough to inform your New York readers, by publication of this letter, that The Scienceers club is again active in this city? It was through the help and cooperation of WONDER STORIES that we of The Scienceers got under way back in 1930; and it would be especially gratifying to us to be mentioned once more in your columns, and to renew our acquaintance with your readers. A few words concerning our nature and activities may not be amiss here.

The Scienceers was founded for the express purpose of providing a meeting ground for lovers of science-fiction, where all phases of this fascinating class of literature might be discussed and commented upon. Meetings are held once a week in a clubroom within easy reach of any metropolitan resident. Membership is open to every one interested in science-fiction and allied subjects. *We have no dues or fees of any kind*—the club is free to all acceptable members.

While our main purpose is to foster fellowship among regular readers of science-fiction, we also endeavor to gain new converts to this field by inviting the general public to our meetings through newspaper announcements. Our "missionary work" along this line has succeeded in gaining a number of new followers for science fiction in general and WONDER STORIES in particular.

All readers interested in The Scienceers may obtain information as to our time and place of meeting by sending a stamped envelope or a self-addressed postal card to our secretary, Allen Glasser, 1610 University Avenue, Bronx, New York.

THE SCIENCEERS,
New York, N. Y.

(Here is a club for science-fiction fans that we have helped to expand. By the fact that the Scienceers charge no fees or dues, it can be seen that there are no mercenary intentions. We hope that this letter brings you many responses.—EDITOR.)

More Back Numbers

Editor, WONDER STORIES:

For the benefit of those of your readers who wish to obtain back numbers of WONDER STORIES, I wish to state that I have a complete set dating back to the first issue, June, 1929, which I will dispose of very reasonably, either as a whole, or by single issues; also every issue of the QUARTERLY and AIR WONDER STORIES, all in fine condition.

HENRY HASSE,
1236 Wade St.,
Indianapolis, Ind.

(Here is another opportunity to secure those back numbers that we have been unable to supply you with. We are sure that Mr. Hasse will receive offers from many of our readers.—EDITOR.)

Another Lost Race

Editor, WONDER STORIES:

On top of several other startling anthropological discoveries comes word of the finding of a lost race in South Africa. This race lived centuries ago and vanished so completely that no one knew of their having lived there. Workmen, excavating for a prison, discovered weird pottery of the people, and found that the clay objects had been lain in circular pits. Also, the present natives of Uganda are worshipping at the mysterious shrine of the lost race even though they know nothing of the shrine's origin or of the ancient god, which was worshipped long before.

Wishing WONDER STORIES unlimited success, I am

FRED J. WALSER,
Denver, Col.

(Archeologists and anthropologists are continually discovering remnants of bygone ages—of races that have disappeared from the earth. Does science fiction seem so impossible in face of this fact? Who knows but that some day it will be proven that an Atlantis and Mu existed with a greater science than ours? It might not be so long before science fiction readers will be able to say: "I told you so!"—EDITOR.)

(Continued on page 668)

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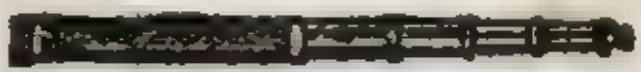

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"	IV.	Skeletal System
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"	VI.	Muscular System (Anterior)
"	VII.	Vascular System
"	VIII.	Respiratory System
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THE READER SPEAKS

(Continued from page 667)

Busy Editors and Snooks

Editor, WONDER STORIES:

I have just obtained a copy of the November issue of WONDER STORIES and it looks like it's going to be good. "The Call of the Mech-Men" by Laurence Manning looks very promising and I'll read it first. The cover is great; Paul distinctly brings out the agonized features of the two men caught in the whip-like coils of the Mech-Men. Yep, sure looks promising.

I notice with disgust that the Editors are still receiving complaints from unappreciative readers. Mr. Kaletsky seems to think that the Editors have nothing to do but twiddle their thumbs. When I paid a visit to the editorial offices of WONDER STORIES, I noticed that the Editors, secretaries, etc., etc., were furiously busy. You wouldn't believe that there can be so much activity in any office. The new Managing Editor's desk was piled high with manuscripts, letters, and so forth. And Mr. Kaletsky thinks that the Editors have nothing to do but sit down and let the magazine edit itself.

Say Editor, PLEASE give us the real lowdown on Epaminondas T. Snooks: is the guy really crazy?—is that his real name?—does he really radio you such insane reports? There's a thousand questions that need prompt answering regarding E. T. Snooks. Please relieve us of this mystery.

I approve of your new small-size magazine chiefly because the larger size is so clumsy to handle and the small size has a larger capacity for stories.

THEO H. LUTWIN,
Jersey City, N. J.

(As you say, most of the readers do not realize how busy the editors of WONDER STORIES are, and minor mistakes are bound to get by once in a while, but we'll wager that you'll find less typographical errors in our magazine than in most others—you may find no errors at all in some issues.

You, like many other readers, would like to know who Epaminondas T. Snooks is. We'd like to tell you, but the truth is that he has lost his memory. As soon as he remembers his identity, we will reveal it to you. Wonder who it could be? Let's see—it couldn't be Einstein or Eddington—they haven't lost their memories, but it's probably some one equally as great. —EDITOR.)

When Scientales Come True

Editor, WONDER STORIES:

I never would have written to you if it hadn't been for the letter of Mr. Kaletsky picking apart your stories. I think that he takes pleasure in finding scientific mistakes and complaining about them. The stories are excellent and a mistake should be excused.

Now here is a question that always sets me thinking. Just suppose that these stories, such as the inventions, space flying, etc., came true. What would the authors write about then?

Is there any chance of getting some of the issues for the earlier part of this year?

JAMES, A. R.

(We are pleased to see that Mr. Kaletsky's lengthy letter has stirred up so much interest. Every one has a right to his own ideas.

When the stories we publish come true, we might have to rename the magazine "True Story," or something like that, and back numbers of WONDER STORIES might be called an Outline of History! But we'll probably have to wait a long time.

Issues from earlier in the year will be sent to you postpaid for twenty-five cents each. Send your remittance to the subscription department.—EDITOR).

Coming!

"DRUSO"

By Friedrich Freksa

—translated from the German

From a Very Active Fan

Editor, Wonder Stories:

Those several new artists are notably good, and in your November issue they have some rather fine material to "draw" from!

Edmond Hamilton is an extra treat nowadays. It always has been that you'd think of five names outstanding in stf., and Edmond Hamilton would be one of them; but he's coming along lately with even better tales, rare and different stories, like "The Island of Unreason," and now "The Man With X-Ray Eyes." "A Conquest of Two Worlds" and "The Man Who Evolved" were stories of the type, too. Having used most adjectives over and again long ago, it's hard to commend: but I must say that the time spent with the new Hamiltonarrative was every bit ■ interest.

Speaking of time brings to mind the "End of Tyme," the issue's "scientifictitioustory." In the absence of Hicks, Posdick, the Dr. Hackensaw, and similars, it is amusing to run across such humor yarns. I enjoy them, and would appreciate their more frequent appearance.

The J. Harvey Haggard "Thru the Einstein Line" was good enough. After all, more or less wild adventure, I think; but when the idol *winked*, that was interesting. Will look for something good in his "Evolution Satellite."

By the way—a random thought—why don't you have a little good poetry once in a while? Like the ones you used to run by the Planet Prince. He had one recently in *Science Fiction Digest*.

"Lunar Consol" seems like a Golf Blight story, but bringing in the Moon, and mystery in Morocco, Mr. Patzer is making of the theme a really good serial.

Laurence Manning has undoubtedly written you the story of the issue. I'll be very disappointed if we don't hear more of the Stranger Club. Five lines, and I was curious and excited. Mr. Manning has become a favorite in an exceedingly short time.

Once more to say I like artists Winter and Burian . . . . . I suppose the size-change can be endured . . . . . And, about scientifilms: present information taken ■■■■■atively points to two picturizations of the end of the world, one of invisibility, an interplanetaryarn, and a story of the future. Even five scientifilms would be a large number compared to the one or two a year of not so long ago. You've seen "Floating Platform No. 1," and S. Fowler Wright's "Deluge"; Wells' "Invisible Man," and the fantasy of a modern Prehistoria—"Son of Kong"—a sequel demanded by the success of the original picture. This surely speaks well for the furthered appearance of stf. themes on the screen, and cannot help but dispel your slight doubt shown in a reply to a recent letter. A sequel to "Frankenstein" is being prepared, and there are twenty-four other scientifilms announced, of which a good portion should appear. Readers interested might write to *Science Fiction Digest*, at 87-36—162d Street in Jamaica, New York.

In conclusion, ask Dr. Snooks if the canals on Mars aren't really just big floods of tears from fans crying for more stories of John Carter; also, if the Moon isn't made of cheese, what theory does he propose to account for the Man in the Moon's rye face?

Forrest J. Ackerman,
San Francisco, Calif.

(The letters from Mr. Ackerman are always refreshing. We print science-fiction poems whenever we get good ones, but we seldom have this kind submitted to us. According to Mr Manning, you will hear more from the Stranger Club. You seem to get first-hand information concerning the science-fiction movies, and we are pleased to hear that a couple of dozen are being planned.

We suppose you mean that if the moon has a wry face and is made of cheese, it is cheese on rye! We are afraid that astronomers will disagree with you.—EDITOR.)

(Continued on page 670)

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1
2
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THE READER SPEAKS

(Continued from page 669)

New Authors Wanted

Editor, WONDER STORIES:

Having read your magazine from cover to cover for some time, we have become quite interested in your type of literature, and find it suitable to our taste, as it deals principally with subjects from which we derive keen enjoyment. We are amateur scientists, you might say, and naturally, we are absorbed in, and engrossed by, such stories as you print.

We have come to believe that we know what you want, and see no reason why we couldn't furnish you with a story or stories, such as those which give a conception of, or insight into, the future achievements of science, including and involving things which may come to be: interplanetary travel and exploration, ideas of adventure and life on all the planets (including Earth) of the future, electricity, chemistry, rays, and mechanical devices. We will, of course, at the same time, make the stories readable and interesting. We believe that we have sufficient imagination, access to proper information, and interest to write things acceptable to your publication. We are of a scientific turn of mind and in school we have majored in the sciences.

We would like to know whether or not you would be interested in considering something submitted by us. If so, we would appreciate an answer to this effect.

JOHN THOMAS, JR.,
EVANS TIVENDELL,
High point, N. C.

(We would be pleased to receive your contributions for our consideration. The editors of WONDER STORIES are always on the lookout for new authors. We will send a copy of our "Suggestions to Authors" to all those who are interested in writing science-fiction, upon request. New blood is what science-fiction needs.—EDITOR.)

A Defense of Foreign Science Fiction

Editor, WONDER STORIES:

After reading "The Synthetic Entity," in the January issue of W.S. I wondered if the author had not made a mistake. One part of the story reads that the protoplasm consumed any food given to it, and thrived on poison. Later in the story it even absorbed a battleship and one or two passenger ships. Yet, an earlier passage states that several parts of this living matter were given to some goldfish which swallowed the stuff without ill effects. Would not this same matter gradually eat the fish from inside and burst through, or, is it the original of one-way traffic?

While reading the letters in "The Reader Speaks," I came across one from a reader named William Biersach, who seems to have a grudge against foreign authors. He has a good case against "The Message from Mars," but it does not mean the author of that story cannot write better ones. WONDER STORIES is already the best scientifiction mag, and as America can claim most of the best writers of this style of fiction, W. Biersach should find it interesting to compare another country's view of future adventure, with that of his own. Other foreign writers may, or may not, be as good as American writers. Until more stories by foreign authors are printed no one can say.

ARTHUR HULME,
Ashton-under-Lyne,
Lancaster, England.

(Your first paragraph proves that you are a careful reader. We hope that Mr. Sharp reads your letter. Perhaps he can defend his synthetic entity.

We certainly agree with your opinion of foreign science fiction. There are several excellent examples now on hand awaiting publication—one by Otfrid von Hanstein is now being translated. Our readers have always admired the German thoroughness in his tales. Where the American author usually hops int his rocket with nary a word as to how it operates, the German writer explains every operation and method of construction so logically that the reader sometimes almost feels confident that he could go back into the woodshed and build one himself.—EDITOR.)

The International Cosmos Science Club

Editor, WONDER STORIES:

May I take a little room in our readers' column in order that I may convey to the intelligent readers of WONDER STORIES the aims and purpose of the International Cosmos Science Club?

The ICSC was organized several months ago and since then it has witnessed a period of rapid growth. The constitution of the club presents the member with an iron-bound guarantee of his rights. In times such as these, when the ranks of science fiction fans are thinned considerably, it is the duty of such organizations as ours to do their part in recruiting new readers. I might use the words that are fast becoming famous, "We do our part."

Many activities are carried on by the club for the benefits of its readers. The foremost among these is the publishing of a monthly newspaper. This paper will carry many scientific articles, along with stories of the variety appearing in WONDER STORIES, written by various members of the club. Every member has a chance to contribute material to the paper. To increase interest, contests along various lines will be conducted by the paper. It will be published in the form of a magazine. The cost of the paper will come out of the dues which will be very low.

Readers of WONDER STORIES are cordially invited to join the ICSC and receive its benefits, and at the same time feel that you are helping to bring science fiction upon a firmer basis while keeping up with science. Anyone addressing inquiries to my address at 512 So. Penna. Ave., Lansing, Michigan or to John Michel, 1694 New York Ave., Brooklyn, New York, will receive application blanks with details of the club.

I have just finished reading the October issue of WONDER STORIES and I was very much surprised at the improvement. Perhaps I was looking at it with less critical eyes after reading the announcement that the next issue was to be the November, which I take means that we are monthly once more. Congratulations!

EDWARD F. GERVAIS,
Division Head, No. 1,
Lansing, Mich.

(We are always willing to aid organizations which aim to spread the popularity of science fiction. We feel that we do our part by publishing letters such as this one. We wish the International Cosmos Science Club all the success in the world, and hope that many readers of this letter will join.—EDITOR.)

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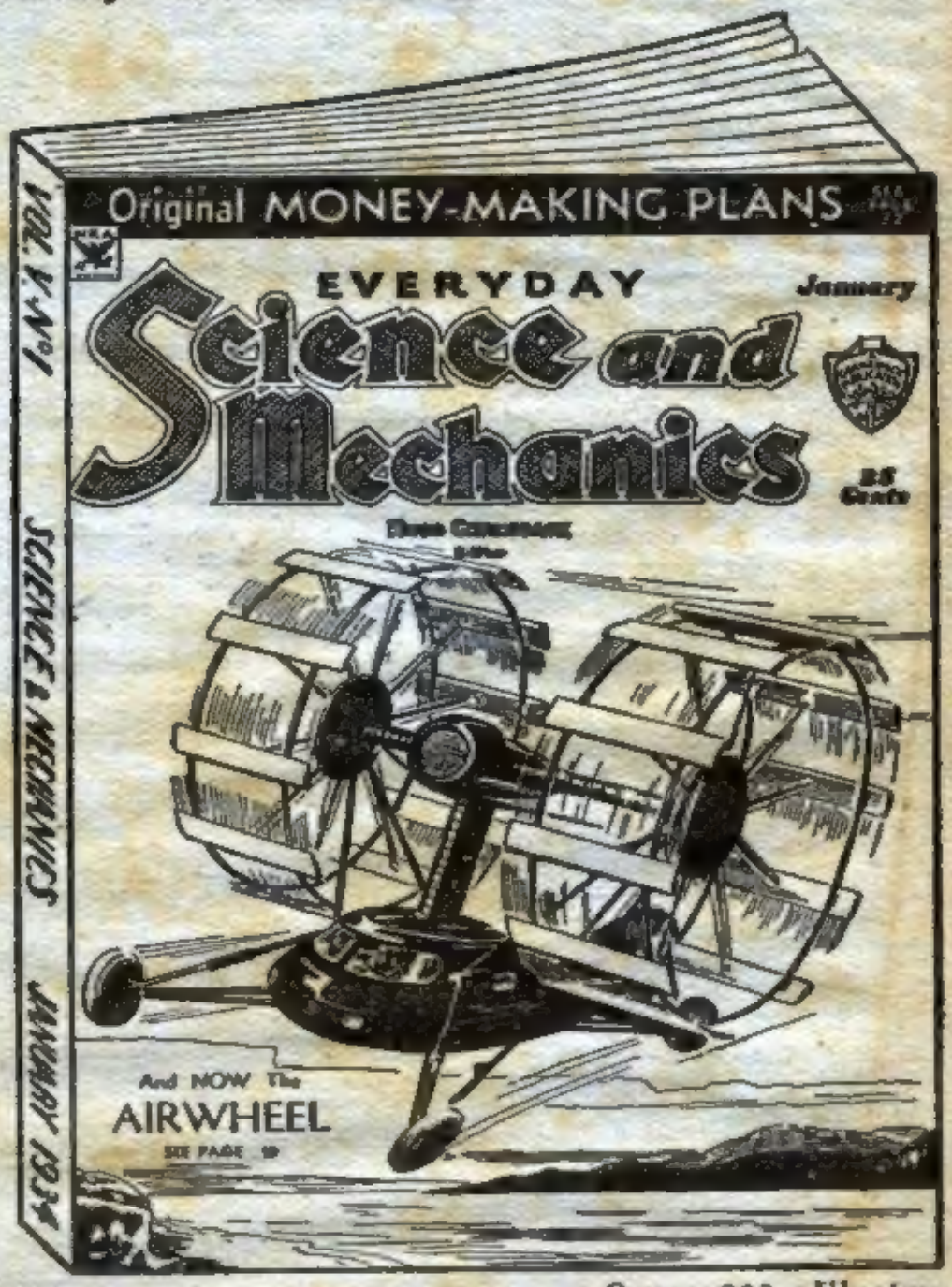

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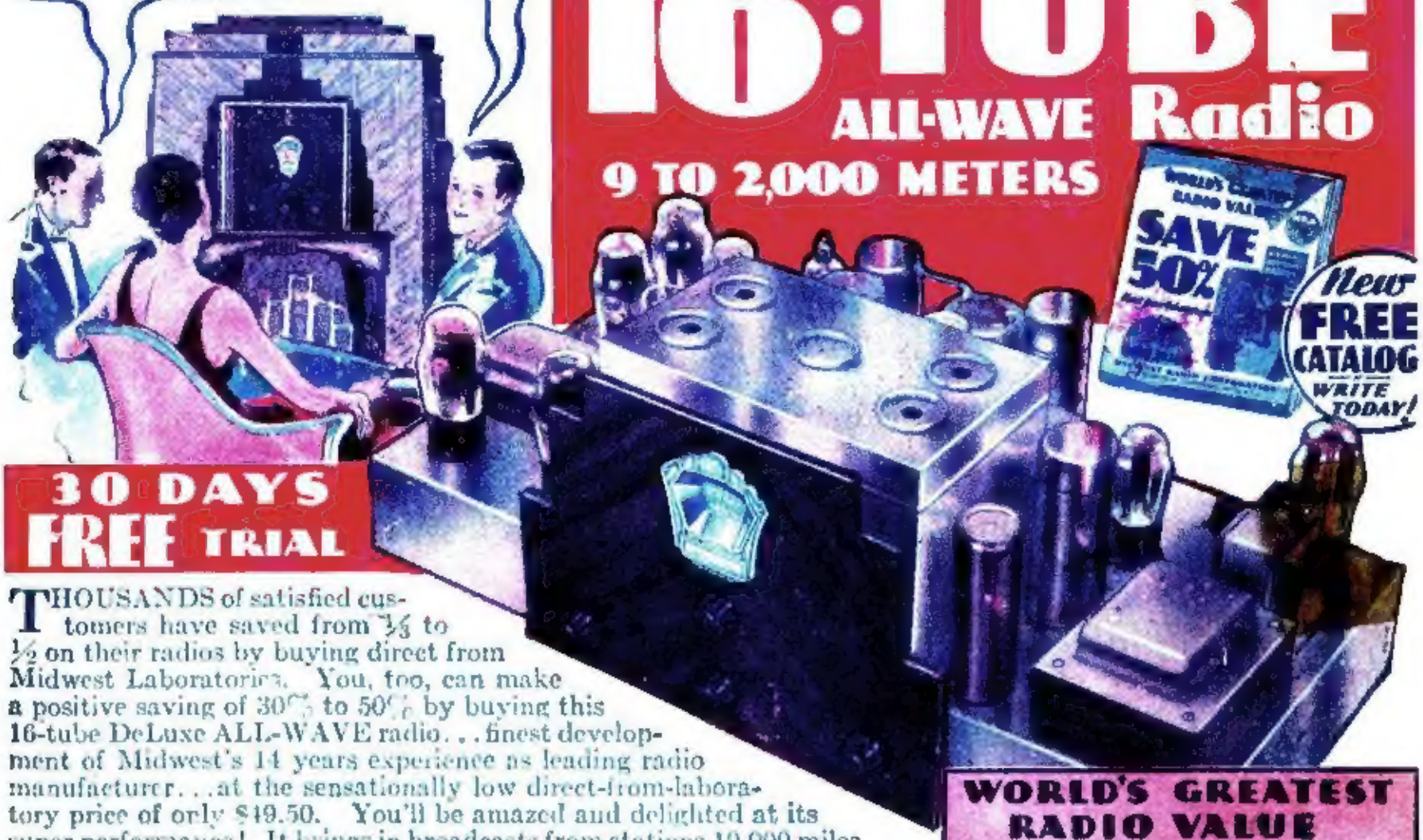

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